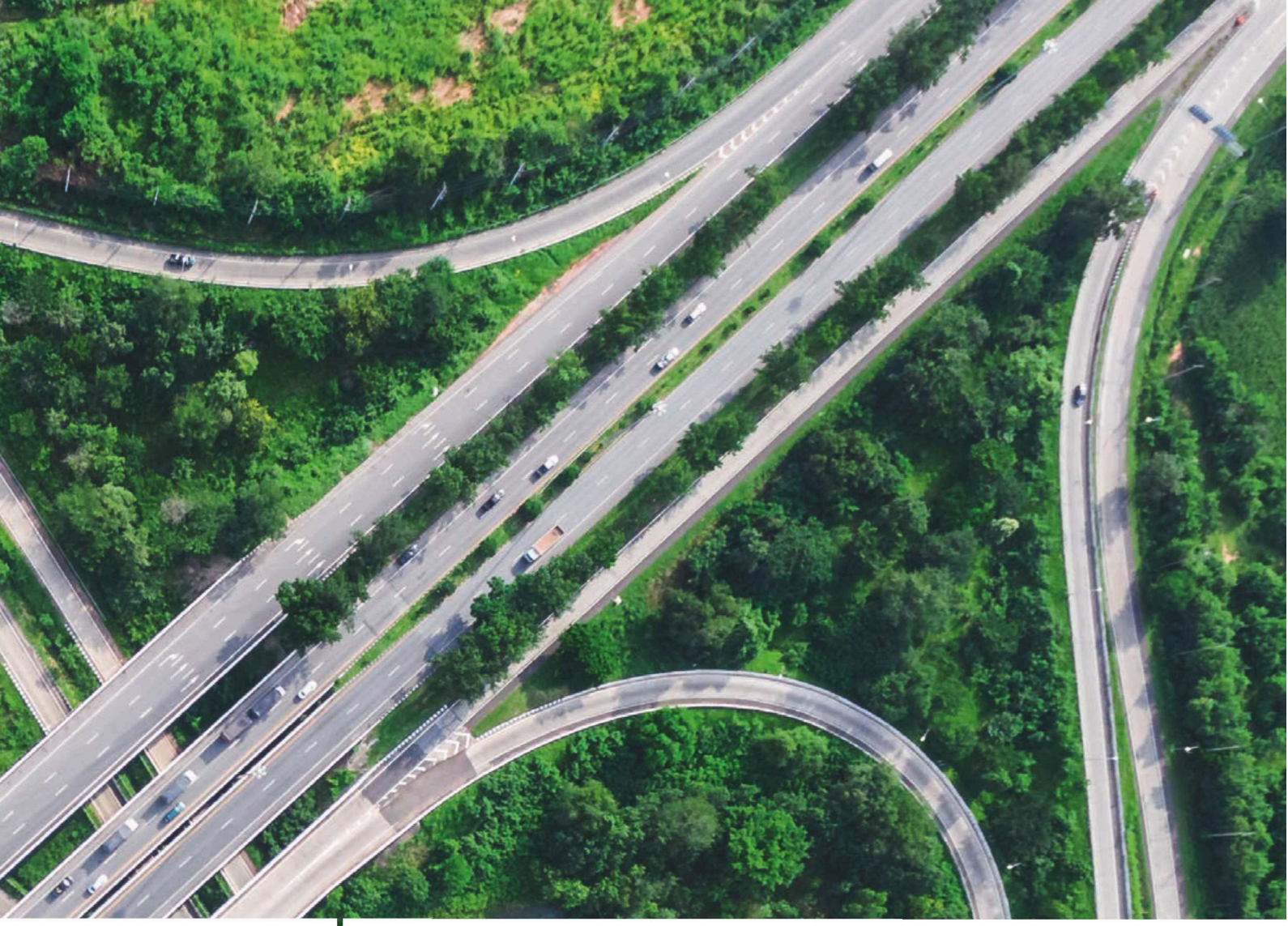
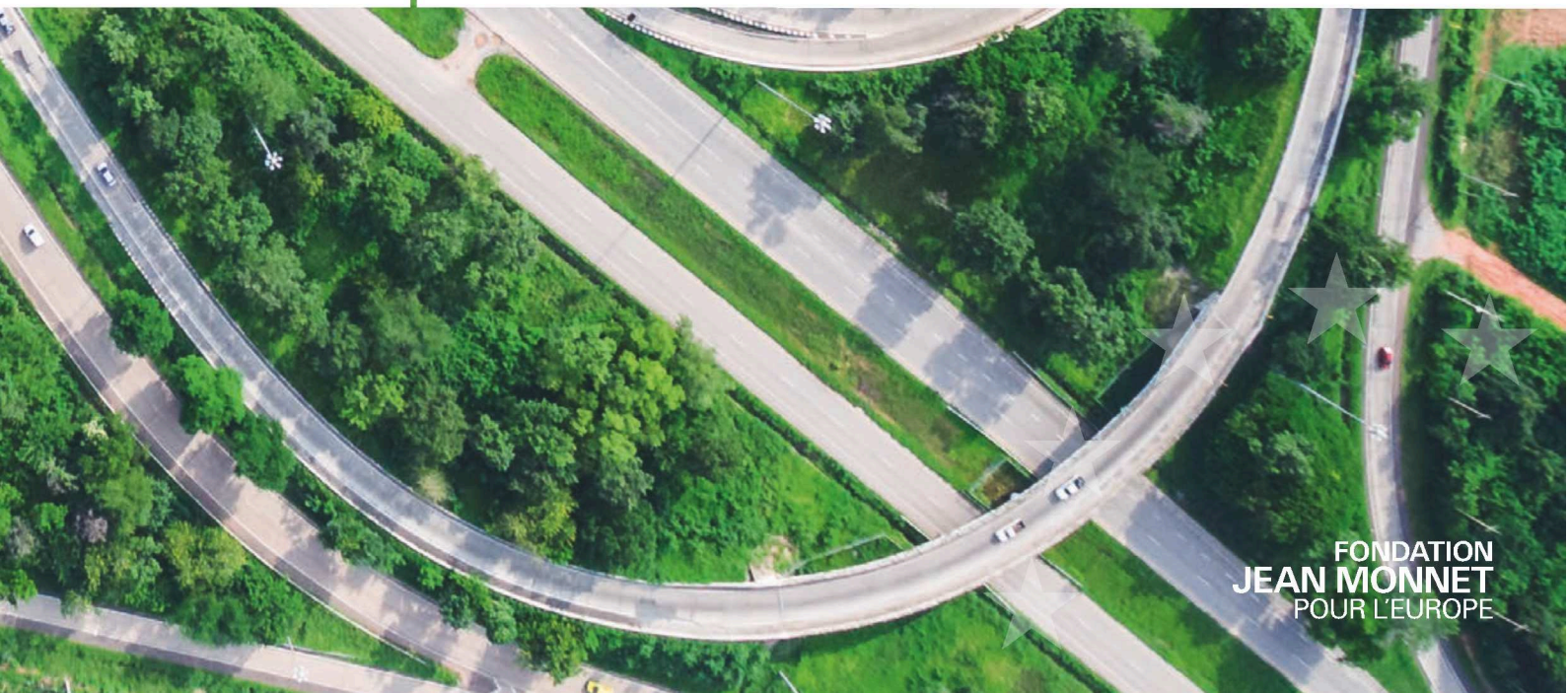


DEBATES AND DOCUMENTS
COLLECTION
MARCH 2018

9

SUSTAINABLE MOBILITY
AN APPEAL TO EUROPEAN DECISION-MAKERS

PAT COX, PATRICK OLIVA
VINCENT KAUFMANN
NIKLAUS LUNDSGAARD-HANSEN
ANDER AUDIKANA, LEO HUBERTS
REPORTED BY EVA PAUL



FONDATION
JEAN MONNET
POUR L'EUROPE

Sustainable Mobility An Appeal to European Decision-Makers

Pat Cox
Patrick Oliva
Vincent Kaufmann
Niklaus Lundsgaard-Hansen
Ander Audikana
Leo Huberts
Reported by Eva Paul

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Towards sustainable mobility in Europe

Key challenges in terms of sustainable mobility

POLITICAL

Enable the emergence of a core group of countries ready to share the leadership necessary to put Europe on the path to transformation. Ensure the coherence and synergy of public policies in the European area.

ECONOMICAL

Endow Europe with new energy and industrial sectors essential to the targeted transformation. Ensure its energy independance and the competitivity of its products and services, all the while supporting employment.

SOCIAL

Create the willingness to improve territorial equity in terms of access to services, and to tackle urban nuisance in order to offer a significantly improved quality of life in rural and urban areas. Innovate in local mobility.

ENVIRONMENTAL

Accelerate the reduction of GhG emissions and the adaptation of infrastructures to climate change. Create the willingness to associate an accelerated practice of circular economy and the progressive elimination of toxic substances from the biosphere, with the dynamics of the Paris Agreement.

Adapted solutions

	Social	Environmental	Political	Economical
New urban models	✓	✓		
Adapting infrastructure		✓		✓
Development of rural networks	✓		✓	
Using economical instruments			✓	✓
Reduce unneeded travel	✓	✓		
Development of low-carbon energy		✓		✓
Defragment supply chains		✓		
Improve modal efficiency		✓		✓

Level of impact:

High Correct Sufficient

Foreword

This forward-looking manifesto is addressed to all European decision-makers belonging to the world of politics, to associations, or to the private sector, be they active on continental, national, urban, or rural levels.

Its purpose is, indeed, to convince all key European actors involved in the mobility sector: the necessity of anticipating the inevitable evolutions resulting from the urgency of climate change is also of a social and economic nature. Placing transport at the heart of the project of the new low-carbon economy, such as was outlined in the 2015 Paris Agreement, can create vast opportunities that will make the fight against global warming the lever of previously unknown forms of economic growth and quality of life. Innovation in this field cannot help but benefit the entire European social and economic fabric—as long as its decision-makers manage to keep ahead of the changes instead of chasing after them, not to mention being subjected to them

Of course, some forms of progress have been made during the past few years in low-carbon transport. They are insufficient, however, in that they are often isolated in their effects, or simply too incremental, merely set up side by side without any mutual interaction, and lacking in overall vision. They must be consolidated if we want Europe to establish itself as the genuine driving force behind a worldwide policy aiming to set up the conditions of efficient sustainable mobility. Whereas the Donald Trump administration announced in June 2017 its intention to withdraw the United States from the Paris Agreement, and whereas recent environmental conferences have underscored how far behind schedule the signatory countries have already fallen in regard to reaching goals[1], the European continent must take on world leadership. By mobilizing the European Union (EU), the European Economic Area (EEA), and the European Free Trade Association (EFTA), the continent can draw the double benefit of competing in an improved world while stimulating its own economy and establishing, notably, more territorial equity for its citizens.

Let us recall that the Paris Agreement, signed in 2015 as the outcome of the United Nations Climate Change Conference (COP21), enabled 195 countries, plus the EU, to make a common commitment to limiting global warming "well below 2° Celsius compared to pre-industrial levels". Public opinions, in their majority, are now sensitive to the necessity of reaching this goal; yet people still need to be convinced of its interest for them, in terms of quality of life and standard of living, especially in the field of mobility and its impacts.

The transport of people and goods, which is the sector first and foremost concerned by the necessity of reducing carbon levels because it still has a 96% worldwide dependency rate on oil, is currently responsible for some 7.7 annual global Gt of CO_2 equivalent (CO_2eq). It is thus all the more urgent to sharpen thinking about mobility on the European level because at least four essential facets are present:

1. **Respecting the Paris Agreement.** This must remain the framework and the point of origin of our thinking. The EU is all the more aware of this in that it sketched out a European leadership right from the preparatory phase of the conference by presenting numerous initiatives as examples even before the agreement was signed. Since then, Switzerland, which was the very first country to submit its INDC's (Intended Nationally Determined Contributions) to the United Nations, has also shown a particularly virtuous willingness to comply. However, it is crucial to remain vigilant that all European partners maintain the commitments they have made.

2. **The economic health of Europe.** It is also because transport makes up a fundamental sector of the European economy that it must be deeply modified on the continental level. The necessary changes involve not only the means of transport, but also the industries and the infrastructures on which they depend. Provided that Europe is the first entity to set into motion this transformation, it can endow itself

1 William J. Ripple, Christopher Wolf, Thomas M. Newsome, Mauro Galetti, Mohammed Alamgir, Eileen Crist, Mahmoud I. Mahmoud and William F. Laurance, "Le cri d'alarme de quinze mille scientifiques sur l'état de la planète", Le Monde, 13 November 2017. Available on http://www.lemonde.fr/planete/article/2017/11/13/le-cri-d-alarme-de-quinze-mille-scientifiques-sur-l-etat-de-la-planete_5214185_3244.html

with the possibility of inventing the models and standards of tomorrow, on the worldwide level. Inversely, if Europe does not manage to do this, it is essential for us to be aware of the dependency that could result from this failure, coupled with dramatic social and economic costs.

3. **The necessity of a more equitable territorial development.** The willingness to reduce inequalities between populations enjoying, or not, an easy access to transport has been expressed many times by EU texts. Aiming for greater equity between urban and rural populations is a strong political issue. Today, this goal has come within reach, with all its corresponding benefits, provided that we dare to envision some specific radical evolutions made possible by new technologies.

4. **The aspiration to a better urban quality of life.** Transport is crucially important for urban zones where, despite its vital role, it brings along in its wake many of the nuisances and kinds of stress that we need to remedy, be they noise and the public health consequences of pollution or the urban congestion that makes these problems worse. This issue is all the more critical in that the urbanization rate in the twenty-eight European countries, plus Switzerland and Norway, is more than 70%, a proportion constantly on the rise.

Paving the way to a transparent discussion between European partners, the Paris Agreement therefore raises hope for the onset of collective thinking about transforming the mobility of people and the transport of goods, by bringing into the discussion the novel perspectives offered by digitalization and the decentralization of energy sources. Up to now, this kind of collective thinking has barely begun. Yet forty-five years have gone by since Europe, brutally faced with the oil crisis of 1973, could have pondered the fragility and geostrategic consequences of an economic system based on fossil resources.

The transport issue has been at the heart of the European project ever since the signing, in 1951, of the treaty binding the six founding countries of the European Coal and Steel Community (ECSC): Belgium, France, Italy, Luxembourg, the Netherlands, and the German Federal Republic. At the end of the Second World War, the primary intention was to institute a climate of perennial peace, thanks to a network of European territories and interests that would make a new war unthinkable.

Six years later, in 1957, the Treaty of Rome, which instituted the European Economic Community, set up the common transport market. Mobility became *de facto* an exceedingly crucial issue in that the four fundamental freedoms put forward by the EEC, the direct ancestor of the current European Union, all directly relate to the free movement of people, goods, capital, and services.

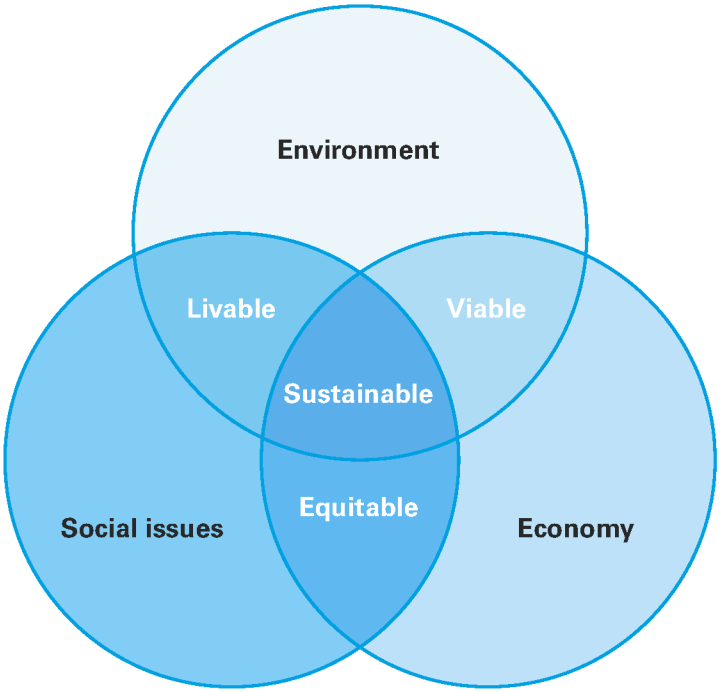
The issue of energy diversification in the transport industry has certainly taken much time to surface, and it is also retrospectively surprising to note that the societal, economic, and political questions related to mobility have remained in the shadows for so long. Admittedly, the willingness to institute innovative European transport initiatives has often run up against the biases and conservative cultures of European States. Each State has developed its own perception of this eminently political issue, whose repercussions are not only economic but also strategic, and this perception is conditioned by national particularities. Whereas the French territorial transport network is strongly centralized—all roads and railroads lead to Paris—and Germany possesses an important waterway transport system because of the economic and geographical importance of the Rhine, seaports have played a fundamental role in the intercontinental trading economy developed early on by Great Britain and the Netherlands.

The topic is complex and the leeway left for progress is large, even if a "classical" view of Europe cannot help but acknowledge one of the best-equipped continents in the world for transport and intermodal possibilities (the sequential, coordinated use of different modes of road, rail, air, seaway, or river transport). Harmonizing national policies for a deep transformation of mobility is an all the more crucial challenge in that it is obviously necessary for solving connected problems: a successful transformation of transport in Europe also guarantees a commitment to resist the temptation to withdraw and take refuge in nationalism that has attained a not insignificant part of the European population during these past few years. Working towards implementing common goals for the development of sustainable, efficient transport also implies stimulating the European process and nourishing it with future projects.

On the societal level, a worthy remodelled transport policy necessitates long-term actions, some of which will obviously affect daily life. However, the required adhesion of European citizens to this

process cannot help but be strengthened when quickly noticeable improvements to daily life are brought about in terms of air quality, noise, security, the complementarity of modes of transport, or the decongestion of cities, to mention only the most immediate aspects.

This transformation will greatly implicate the private sector, called upon to be a driving force in developing a transport strategy that is not only sustainable but also economically viable in a context of tough competition. The vision we are advocating in this manifesto is meant to generate healthy economic growth relying on the three pillars of sustainable development: the social, environmental, economic pillars. To back the innovation needed for this, strong political decisions and sufficiently large economic investments are called for. It is not merely a matter of definitively turning the page of our hyper-dependency on fossil energies, but also of turning to a new page, which will be brilliant for Europe only if it avoids putting itself in the position of being dictated to, a risk that must not be underestimated with respect to transformation initiatives that are already taking place, especially on the continent of Asia.



Contextual elements

As regards the mobility of people and freight, the situation is far from being the same over the entire European continent. Geographical differences give birth to distinct needs, depending on the country in question. The Rhine River valley, for instance, has organized mobility in ways that do not correspond to the needs expressed by more outlying countries, not to mention insular territories. This manifesto, far from remaining unaware of these specificities, intends, on the contrary, to bring them into the discussion: rethinking mobility according to the criteria of sustainability and accessibility will necessarily have consequences on the territorial network of Europe, and it is wise to anticipate them.

A POLITICAL CONTEXT

a. The need for European leaders to take dynamic action

One fact is obvious: despite its decisive importance for the building of Europe, the transport sector does not currently appear to be one of the main preoccupations of the EU in terms of reducing carbon levels. Yet ambitious goals were set as early as 2011, with the publication of the White Paper *Roadmap to a Single European Transport Area: Towards a Competitive and Resource-Efficient Transport System*[2]. This White Paper aimed at a 20% reduction of greenhouse gas emissions in the transport sector by 2030, in order to reach a reduction in the range of 60% by 2050, the level in 1990 having been adopted as the reference point. In July 2016, the European Commission reasserted its goals by publishing *A European Strategy for Low-Emission Mobility*[3], which outlines a series of actions likely to speed up the transition toward sustainable mobility. Adopted one year later, in November 2017, the *Mobility and Climate Change* package[4] includes several measures designed to "reinforce EU's global leadership in clean vehicles": it establishes new goals, as regards average CO_2 emissions for all new personal vehicles and vans in the EU, which will be applied beginning in 2025. Moreover, new strategies began to be studied in 2015 with the aim of improving the connection and interoperability of the major traffic routes, notably by means of "trans-European network corridors"[5]. Finally, it must be acknowledged that the European Commission has made great efforts to finance research which, unfortunately, has often not gone beyond the stage of prototypes and pilot projects.

It would thus be erroneous to claim that Europe has lost interest in the necessity of transforming mobility. However, Europe has tended to accumulate goals, putting forward new ambitious objectives before previous goals have been met. On the political level, thinking about mobility must henceforth entail a practical plan of action. Decision- makers must come together and agree on a genuine transformation policy that will go beyond a mere incremental stage that reiterates goals more than dealing with the effects actually produced by them and that, in fact, contents itself with improving the present without deeply modifying it.

However, a second observation now tempers our first one: during these past few years, awareness has clearly been raised about the urgency of climate change. Today, more and more voices call for commitment to action. Not only some big cities are pushing for change (see below), but national governments are also getting more involved as the years go by. Preceded by Switzerland, the European States have all submitted their first NDC's (Nationally Determined Contributions), following upon the Paris Agreement—as have 167 of the 195 signatory countries to this day[6]; by a parliamentary decision made in June 2016, Norway, the biggest

2 European Commission. *Roadmap to a Single European Transport Area: Towards a Competitive and Resource-Efficient Transport System.* Luxembourg: Publications Office of the European Union, 2011. https://ec.europa.eu/transport/themes/strategies/2011_white_paper_en

3 A European Strategy for Low-Emission Mobility, COM(2016) 501, July 2016. https://ec.europa.eu/transport/themes/strategies/news/2016-07-20-decarbonisation_en

4 The Commission adopts the Mobility and Climate Change package, 8 November 2017. https://ec.europa.eu/commission/news/commission-adopts-mobility-and-climate-change-package-2017-nov-08_en

5 *Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 61/2010/EU, OJ L 348,* 20.12.2013, pp. 1-128.

6 Nationally Determined Contributions per country http://www4.unfccc.int/ndcregistry/Pages/All.asp

European hydrocarbon producer, resolved, following upon the Paris Agreement, to aim for carbon neutrality by 2030 (Zero Net Emissions), that is, twenty years earlier than the goal initially scheduled for 2050[7].

b. European cities as vision bearers

Several big European cities are committed to reducing carbon levels in practical ways. As they seek to innovate in mobility, to better serve their inhabitants, these cities are bearers of decisive initiatives. To this day, several such cities have created, or have planned to create, "Low Emission Zones" (LEZ's, in which soft, non-polluting kinds of mobility are favoured, with only limited access given to polluting vehicles, in an attempt to improve air quality), and some cities plan to bring into effect "Ultra Low Emission Zones" (ULEZ's) and even Zero Emission Zones (ZEZ's). For example, London will be a ULEZ in 2019, and Copenhagen a ZEZ in 2025. Progress can be made very quickly! Oslo, for instance, has announced several ambitious urban transformation measures with the goal of reducing greenhouse gas emissions by 50%, in only four years, with a 95% reduction by 2030[8]. By encouraging and developing soft mobility, the Norwegian capital plans to completely close off the town centre to vehicles and to increase parking restrictions around the capital.

Such initiatives, which are both creative and structuring in their ecological commitment, are cropping up across Europe. They range from increasing the number of pedestrian zones and bike lanes to scheduling the prohibition of diesel, to encouraging car sharing, and so forth.

If most of these initiatives remain local in scope, others are starting to rely on an international network extending beyond the confines of the continent. This was seen in October 2017 during the annual Together4Climate summit meeting, which took place in Paris. Twelve big cities belonging to C40 (a network of 91 megacities that is currently presided over by Paris Mayor Anne Hidalgo) shared their commitment to make, by 2030, an important part of their city centres a Zero Emission Zone[9]. No less than five of these twelve megacities are European: Paris, London, Barcelona, Copenhagen, and Milan have committed themselves to this goal, alongside Quito, Vancouver, Mexico, Seattle, Cape Town, Los Angeles, and Auckland.

These commitments, which speed up the dynamics of change, demonstrate that there now exists a political space wherein appropriate models can be worked out. It can nonetheless be deplored that no coordinated European programme accompanies these blossoming initiatives and encourages other cities to follow suit—cities which, moreover, should not be limited to big cities. Intergovernmental initiatives are, in fact, too few in number despite European Mobility Week[10], which takes place every year in cities wishing to be associated with it. (2526 such cities took part in 2017, 542 of which were decreed "Golden Participants" for having met two supplementary criteria: adopting a perennial measure in favour of soft or sustainable mobility and setting up a carless day.) If the countries most involved in this European programme have remained Austria, Spain, and Hungary from one year to the next, several East European countries were especially mobilized last year, including Poland and Rumania.

It is all the more important that the EU accompany the paradigm shift initiated by these big cities in that the territorial network is at stake: should the transition take place at various speeds, because of local political contexts, vast inhabited zones and whole segments of the population are likely to be overlooked. Once again, we meet up here with the issue of equity in regard to a well-conceived mobility, the *sine qua non* condition for a better distribution of the population and for territorial economic vitality—not to mention the dangers resulting from letting a sentiment of relegation build up: it suffices to compare a map of populist voting with an analysis of transport, in terms of density and quality, to be convinced of this.

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7 *Sciences et Avenir* with the AFP, "La Norvège vise la neutralité carbone dès 2030", *Sciences et Avenir,* 17 June 2016 https://www.sciencesetavenir.fr/nature-environnement/pollution/la-norvege-vise-la-neutralite-carbone-des-2030_18708

8 Anne-Françoise Hivert, "À Oslo, un horizon sans voiture et sans carbone", *Le Monde,* 11 April 2017 Available via this link: http://www.lemonde.fr/planete/article/2017/04/11/a-oslo-un-horizon-sans-voiture-et-sans-carbone_5109173_3244.html

9 Laetitia Van Eeckhout, "Douze grandes métropoles veulent devenir des territoires sans énergies fossiles d'ici à 2030", *Le Monde,* 23.10.2017 Available via this link: http://www.lemonde.fr/smart-cities/article/2017/10/23/treize-grandes-metropoles-veulent-devenir-des-territoires-sans-energie-fossile-d-ici-a-2030_5204747_4811534.html

10 See http://www.mobilityweek.eu

c. Towards a European model?

In a globalized economic context, the harmonious transition towards a sustainable transport economy cannot help but be advantageous to Europe, placed *de facto* in the position of world leadership because of the withdrawal of the American administration from this field. Yet to assume this role, Europeans must successfully work together towards organizing an expanding market and new kinds of cultural behaviour on the continental level.

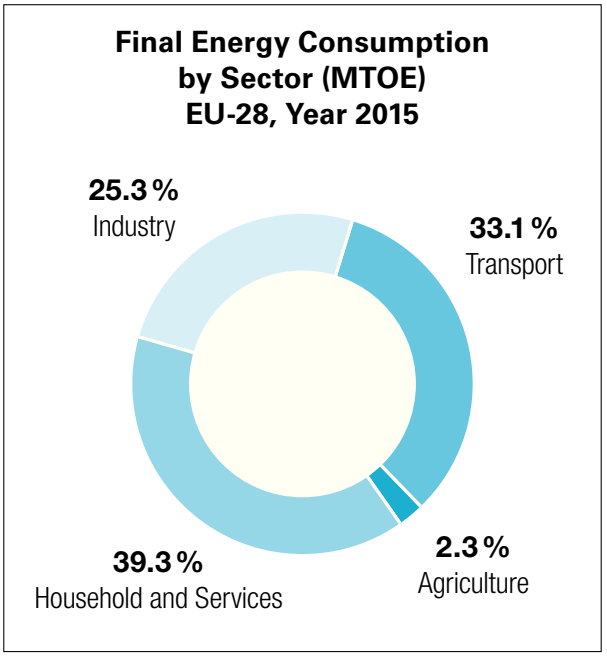
Since 1957, European strategies have obviously evolved. They have gradually taken into account the necessity of harmonizing transport in Europe and of accompanying the emergence of a sustainable model. Yet when the time comes for resolute political choices, sometimes under pressure, this necessity is too often put on a back burner in favour of a primary goal: the efficiency of the transport system within the European common market[11]. From now on, we must stop pitting these two goals against each other—and reconcile them. Although efficiency is a vital matter—since both European construction and the cooperation between European States depend on prosperity—Europe will not be able to remain, in the medium and long term, an enviable area of the world unless it assimilates the paradigm shift called for by populations. The issue is exceedingly sensitive in that the transport sector, which remains largely dependent on fossil energies, is constrained to carry out a systemic transformation at the very moment when it is facing tough competition that is likely to increase. Once again, the stakes are collective, and only coordination on the European level will make it possible to go forward as quickly and as far as is needed for the transformation.

STATISTICAL ELEMENTS

a. Energy and environment

According to European statistics published in 2016, greenhouse gas emissions in the EU-28 reached, in 2014, 4.282 $MtCO_2eq$ (millions of tonnes of CO_2eq)[12], 23.2% of which are attributable to the transport sector (people and freight). In 2015, transport represented 33.1% of the total energy consumption. This makes this sector the second biggest energy user, behind the household and services sector (39.3%), but ahead of industry (25.3%) and agriculture (2.3%)[13].

According to sources, it is estimated that passenger transport represents approximately two-thirds of the energy consumption in the entire transport sector, and freight transport the remaining third; that is, respectively 20% and 10% of the total energy consumption. For example, one of the thematic reports resulting from the "Assises nationales de la mobilité" initiative, organized by the French Ministry for the Ecological and Inclusive Transition, brought forth the following proportions for France: "the greenhouse gas emissions (GHG emissions) of road transport (126 $MtCO_2eq$ in 2015), which is highly dependent on fossil fuels, represent 95% of the GHG emissions of the sector. Personal-use vehicles emit more than half of the GHG emissions in road transport, light commercial vehicles emit 20% of the GHG emissions in road transport and heavy vehicles a little more than 20%"[14].



11 In light of the second chapter of the White Paper on transport: "Growing transport and supporting mobility while reaching the 60% emission reduction target". https://ec.europa.eu/transport/sites/transport/files/themes/strategies/doc/2011_white_paper/white-paper-illustrated-brochure_en.pdf

12 *EU transport in figures: Statistical pocketbook,* European Commission (2016), p. 124.

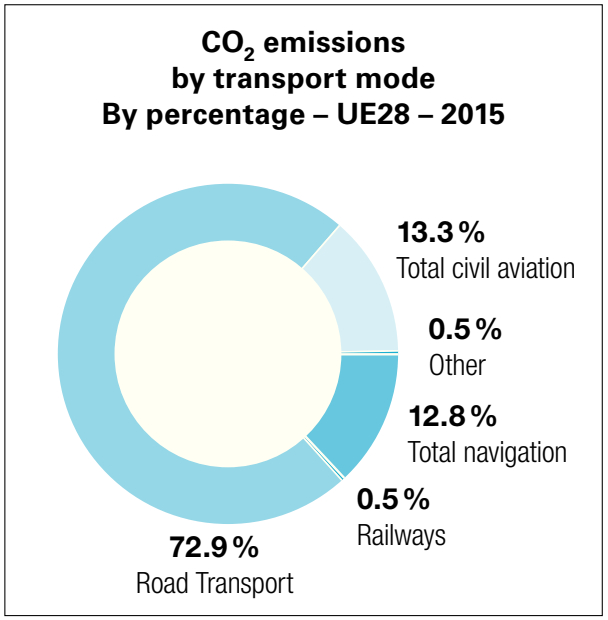
13 *EU transport in figures: Statistical pocketbook,* European Commission (2017), p. 121.

14 "Pour des mobilités plus propres", report of the thematic workshop directed by Patrick Oliva, dated 6 December 2017.

Between 2014 and 2015, passenger transport increased by 2.6% and freight transport by 1.2%[15], respectively attaining the figures of 6.477 million people per kilometre and 3.514 million tonnes per kilometre. It is particularly enlightening to note that freight transport, which has constantly increased since 1995, experienced a drop of 15% between 2008 and 2009 because of the economic crisis. This reinforces the observation of a direct correlation between the vitality of transport and the creation of economic wealth, even if it remains difficult to prove to what degree improving transport generates an increase in the GDP or, inversely, growth in a country's GDP creates an increase in transport.

One also notices that the number of fleets of vehicles increases even faster than the effects of the technical progress made in decarbonizing vehicles, a gap that is likely to grow if energy measures are lacking.

Road transport (people and freight), which remains largely dominant, generally emits the most CO_2: it is considered to be responsible for 72.9% of the total of greenhouse gas emissions attributable to all kinds of transport, in comparison to 13.3% for air traffic and 12.8% for maritime traffic[16]. In contrast, rail transport emits the least amount of CO_2 (see below).



These several elements provide a way of measuring the challenge represented by transport in the energy and environmental issue for Europe. However, it is advisable never to neglect the fact that transport is always a derived demand. One does not move from one place to another out of simple pleasure, but rather to reach a chosen destination or to respond to an economic or a commercial need. By confining the search for specific solutions to the transport sector *per se*, their scope is likely to be narrowed; the very need to move from one place to another is also likely to evolve or be rationalized. This is what is at stake in the TDM (Transport Demand Management) systems that are being developed today. Traditionally based on supply-side economics (and mass supply), the sector has undergone for a few years now, notably boosted by digital technology but also because of evolving uses, a "mutation" towards a more diversified type of demand-side economics implicating various actors for "customized solutions".

Through the prism of the various mobility studies that have been undertaken, the available statistics argue for ranking priorities in this order:

1. **Remodelling the means of transport** on the urban level.
2. **Improving mobility for commuters and the access to economic centres** from inhabited suburban areas.
3. **Achieving a new balance for commercial transport,** while remaining aware that the latter calls for a flexibility that the roadway network offers better than any other means of transport.

b. Intermodal possibilities

As we have seen, even more for passenger than for freight, road transport remains largely dominant in Europe, which, with respect to the other big world regions, nonetheless benefits from particularly competitive infrastructures and technologies to reinforce the complementarity of various modes of transport: notwithstanding the strong quantitative differences between countries, all the modes of transport are developed on the continental level. In contrast, only China has a better score than the EU for the number of railway users (in millions of kilometres). On the other hand, it can be noted that the EU is only fourth in railroad freight transport, behind Russia, the United States, and China[17].

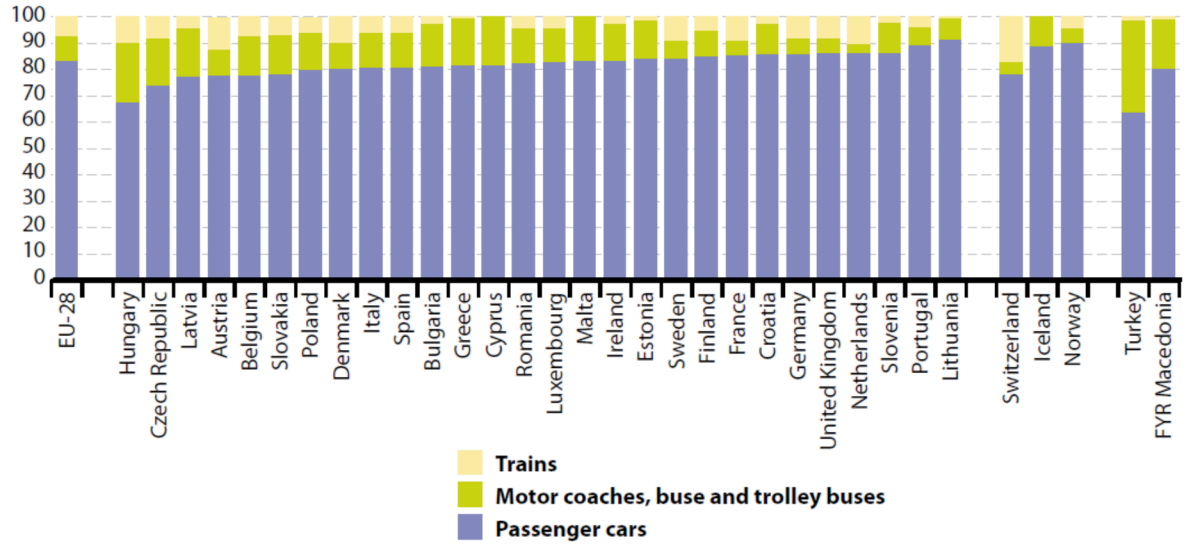
This overall comparison obviously conceals great disparities. Whereas trains do not exist in Malta, because there is no infrastructure, rail transport in

15 *EU transport in figures,* European Commission (2017). Op. cit., p. 21 et 34.
16 *Ibid.,* p. 135.
17 *EU transport in figures: Statistical pocketbook,* European Commission (2017), p. 34

Switzerland nearly equals road transport as far as freight is concerned. Moreover, as a mountainous territory at the centre of Europe, the Helvetic Confederation shows itself to be a country of intense, important rail transit for the entire continent. This characteristic was a main issue when the first agreements between the Confederation and the EU were negotiated during the 1990s: whereas the EU wished to increase the tonnage of lorry traffic, Switzerland wanted to continue to count on combined road-rail transport to reduce lorry traffic, which is especially harmful in mountains. The Swiss alternative won out and has, moreover, enabled Switzerland to establish itself as a country that is ever more innovative in terms of the modal shift from road to rail transport. It follows that countries like Spain, Greece, or Ireland possess an obvious potential for improvement.

Modal split of passenger transport by country 2013

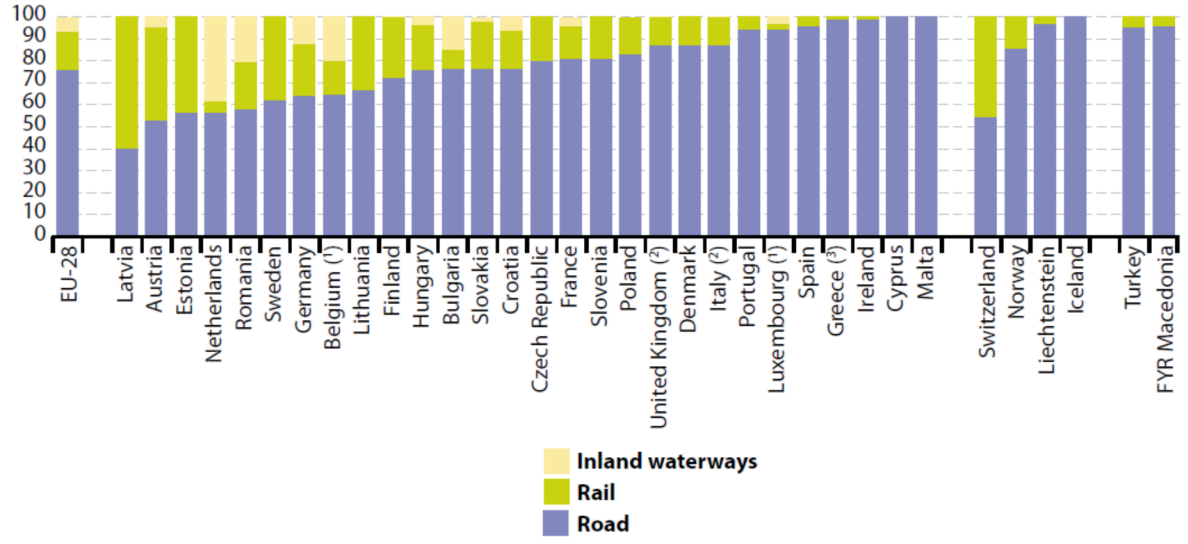
Source: Eurostat[18]



(1) Estimated or provisional data for most Member States (too numerous to be listed).

Modal split of freight transport by country 2013

Source: Eurostat[19]



(1) Estimated data (all modes). (2) Estimated or provisional data for inland waterways. (3) Estimated data for rail.

18 Eurostat, Statistics Explained, data from July 2015
http://ec.europa.eu/eurostat/statistics-explained/index.php?title=Sustainable_development_-_transport&oldid=329212

19 *Ibid.*

It can also be noted that freight transport, on the whole, uses the railroad more often than does passenger transport. This argues for calling into question the mobility habits of people as well as their reasons for recurrently preferring individual transport—yet it must be kept in mind that there is sometimes no available alternative.

With the "single European sky" implemented by European regulations in 2004, air transport has continued to increase during the past several years. It must nonetheless be pointed out that 75% of the trade between Europe and other countries, and 40% of the freight within Europe, is shipped by sea, and that some 400 million passengers use European waterways every year[20].

A SOCIAL CONTEXT

Ever since it was founded, Europe has actively promoted its mobility project. The very notion of European integration was conceived, beginning with the post-war period, as a process of increasing and deepening the exchanges between the populations of the various Community countries, which necessarily implies physical movement from one place to another. More basically, the EU claims to ensure the social and economic integration of its citizens by means of the free movement of people, goods, services, and capital. In short, mobility has been considered to be an integrative value for bringing peoples together and thus a guarantee for the future, promising peace and prosperity to the continent.

This model seemingly reached its limits at the end of the last century, not only because mobility needs to be reconsidered for environmental reasons, but also because the dynamic of European integration has been unable to thwart the destabilizing forces fostered by globalization, which is itself based on the liberalization of financial and economic movements. Protectionist, even isolationist rhetoric resonates powerfully in the ears of a growing part of the European population and denies the benefits long attached to the notion of free movement. When the United Kingdom, a country with a strong liberal tradition, created an earthquake by voting for the Brexit, it was as if the mobility and the mixing of populations had evolved from a solution to a major problem within the Old Continent.

Henceforth, rethinking mobility must consider not only the issue of instituting sustainable transport, but also how to do so without neglecting or worsening social cohesion on the continental level. This context argues for a different way of hierarchizing priority policies: that is, favouring measures that aim to improve transport conditions on the local level rather than giving priority to national and international fast-transit infrastructures (airports, high-speed railway lines, or motorway networks). At stake is the quality of daily life, obviously, but also and more widely equity: in this regard, one cannot neglect the studies of the International Transport Forum (ITF), which suggest a direct correlation between poverty levels or unemployment rates and the access to transport networks[21]. For individuals, adequate local transport facilitates not only entering, or returning to, the labour market, but also access to health, education, political and cultural institutions, and even the setting up of a social network that is not restricted to one's immediate neighbourhood.

It is a fact that disadvantaged population groups are generally relegated to peripheries far from urban centres because of the housing costs in city centres. And these outlying quarters turn out to be increasingly less served by public transport to the extent that their poverty is more widespread. The case of Clichy-sous-Bois, in France, where 40% of the population lives below the poverty line and the unemployment rate reaches 23%[22], is striking: whereas the city is located 23 kilometres from the centre of Paris—a twenty-minute drive by car in normal traffic—the trip to get there by public transport takes more than an hour, even an hour and a half, because there is no direct connection[23].

The spectacular quality of this example notwithstanding, Clichy-sous-Bois is far from being an isolated case. Other studies, which focus on Berlin, show a similar correlation between poverty and a reduced access to mobility in the quarters of

20 EU Transport Policy
https://europa.eu/european-union/topics/transport_en

21 *Income Inequality, Social Inclusion and Mobility,* ITF Roundtable 164, Leipzig 2017
https://www.itf-oecd.org/sites/default/files/docs/income-inequality-social-inclusion-mobility.pdf

22 See https://www.insee.fr/fr/statistiques/1405599?geo=COM-93014

23 « Emmanuel Macron, ne relancez pas la guerre entre les territoires », *Le Journal du Dimanche,* 22 October 2017.

Marzahn, Spandau or Neukölln[24]. These quarters are albeit all located in the former East-German part of the city, but the mediocre access to public transport that characterizes them intensifies even more the problems of unemployment and endemic poverty in the territories of the ex-German Democratic Republic. Today, it is the whole issue of the "inclusive" quality of the urban and suburban planning that has been raised.

Inversely, studies conducted by the EU show how the increase in intra-European mobility has been accompanied by a reduction in unemployment in several EU countries[25]: the concomitance between the mobility factor and the employment factor exists at the continental level as well as at the local level. The issue is thus not that of brutally changing from a model favouring fast transit over long distances to another model exclusively focused on the quality of local transport, but rather one of giving increased attention to the latter, not only to improve the quality of life but also with the goal of preventing the creation of relegation zones within prosperous regions. It follows that it is all the wiser to accompany the recent, rapid emergence of new sharing practices, like car sharing.

AN ECONOMIC CONTEXT

According to the 2017 statistics of the European Commission, the transport sector represented 651 billion euros in Gross Value Added (GVA) for the year 2015; that is, 5% of the total GVA for the EU-28 (including postal transport and courier services)[26]. The transport sector represents 11.2 million people, that is, approximately 5.2% of the workforce of the EU[27], whereas this figure represents only businesses directly related to the transport sector: it does not take into account people employed in businesses with different kinds of activity yet who use their own means of transport.

In 2014, Germany, France, Italy, and the United Kingdom had more than 1,000,000 people employed in the transport sector, the majority of them in road transport. With 190,480 businesses belonging to this sector, Estonia is the country with the highest number of transport-associated businesses in the EU.

In Europe, the transport industry (which varies greatly depending on the country in question) shows mixed performances in terms of kinds of activity. Generally speaking, the traditional transport industry is doing well. The automobile sector is especially powerful in Germany because of the Volkswagen, Daimler Benz and BMW groups, whose models are sold worldwide, but it also thrives in other European countries such as France, Italy, and Spain. The automobile sector benefits from the excellent health of Airbus, a European project whose revenues are constantly on the rise. The German National Railway company (Deutsche Bahn) and the French National Railway Company (SNCF), as well as their partners, have a strong international image, but it is in Switzerland, because of the local importance of railway transport (as mentioned above), where businesses using rail transport are the most competitive, demonstrating once again that a sector enjoys a better export performance if it is dynamic locally.

In contrast, the European transport industry shows glaring quantitative weaknesses in future sectors such as biofuels, clean hydrogen, fuel cells, batteries, synthetic fuels, and electric buses. These future sectors should be encouraged by vast industrial initiatives. For example, Europe already produces a significant number of electric vehicles, yet the batteries used in them are mostly imported from Asia. It is urgent to take action. The European Commissioner in charge of the Energy Union, Maroš Šefčovič, has just announced, in fact, a strategic plan for competing with the Asian battery sector, a plan conforming to the 2030 strategy for climate and energy[28]. Equivalent measures are equally needed for fuel cells, super condensers, solution sectors for all sizes of hybrid and electric vehicles, ITS technologies, facilities for charging batteries and filling tanks with hydrogen.

24 Senatsverwaltung für Stadtentwicklung und Umwelt, *Mobility in the City; Berlin traffic in Figures,* 2013 https://www.berlin.de/senuvk/verkehr/politik_planung/zahlen_fakten/download/Mobility_en_komplett.pdf

25 *EU Employment and social situation: Recent trends in the geographical mobility of workers in the EU,* Quarterly Review, Supplement June 2014, European Commission, 2014 http://ec.europa.eu/social/main.jsp?catId=113&langId=en#ESSQR

26 *EU transport in figures: Statistical pocketbook,* European Commission (2017). Op. cit., p. 19.

27 *Ibid.* 4.4 % of total employment if postal and courier activities are not included.

28 See: https://ec.europa.eu/clima/policies/strategies/2030_en

Overall, the EU thus benefits from a strong economic situation in terms of transport, but it has also become imperative to accompany the massive transformation of industrial production towards low-carbon solutions, with which solutions for connected infrastructures as well as for assisted and even (almost) autonomous vehicles should be associated. Taking into account the private sector is crucial since the success of current transformations will depend on their economic feasibility, on the mastery of their qualitative and quantitative industrial factors, as well as on our ability to keep the willingness to regulate from colliding with the most conservative lobbying—as was visible during the most recent negotiations on the 2025-2030 emissions standards for European cars. Freight and road transport businesses are especially quick to react against practical measures whenever the latter seem to hinder their short-term development. Once again, associating in practical ways the most innovative part of the private sector with thinking about current changes cannot help but be beneficial; it would allow, on the one hand, the professional expertise of the private sector to be used profitably, and, on the other hand, new perspectives engaging all the actors in the sector to be conceived.

Changing the terms of the debate

The time has come to dare to implement more radical approaches.

Up to now, most political methods have indeed shown their limitations, in terms of efficaciousness, for two main reasons: first, they focus on aspects inherent to mobility yet neglect its stakes and constraints; second, political processes put forward incremental approaches more often than they show willingness to deeply transform the sector.

We can no longer reflect on the necessary evolution of transport without considering all the parameters that affect mobility. This is why our approach brings together the social, economic, and environmental aspects of mobility into a single way of considering the issue, all the while putting forward new viewpoints. This by no means excludes major short-term advances, while it faces up to, in the best possible conditions, the upheaval that the urgency of climate change imposes upon European reality.

IN SOCIAL TERMS

Although this manifesto is initially addressed to European decision-makers, it also falls within the framework of a sustainable vision of society on the world level. Its goals are not limited to Europe, and many of its preoccupations, especially those aiming to favour equitable access to sustainable urban mobility, are at the heart of the "New Urban Agenda" of the Habitat III Conference organized by the United Nations (UN) in November 2016, in Quito, Equator[29]. Non-binding, but decisive for the working out of national urban policies, the final Declaration recalls that cities, although making up only 2% of the total land area of the planet, alone represent 70% of the economic activity, more than 60% of the energy consumption, and 70% of the GHG emissions.

One year after the Paris Agreement, the challenge of the Quito conference was to stimulate urban development policies linked to the UN resolution of September 2015, "Transforming our world: the 2030 Agenda for Sustainable Development"[30]. Presenting seventeen "sustainable development goals" (SDG), this resolution aims to "strengthen universal peace in larger freedom. We recognize that eradicating poverty in all its forms and facets, including extreme poverty, is the greatest global challenge and an indispensable requirement for sustainable development." It would be erroneous to consider this text as relating to only developing countries. Europe must also deal with some kinds of poverty and experiences a growing disparity of resources between individuals.

Putting forward the significant social consequences of the battle against climate change, this United Nations resolution includes no theme specifically related to sustainable mobility. Yet sustainable mobility is not less directly affected by at least four of the seventeen set goals:

- "End poverty in all its forms everywhere"—which calls for equitable access to economic centres;
- "Ensure access to affordable, reliable, sustainable and modern energy for all"—through the development of renewable (and often decentralized) energies;
- "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation";
- "Make cities and human settlements inclusive, safe, resilient and sustainable".

29 HABITAT III The United Nations Conference on Housing and Sustainable Urban Development http://habitat3.org/

30 Assemblée générale des Nations Unies, Résolution adoptée par l'Assemblée générale le 25 septembre 2015. http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&referer=/english/&Lang=E

In the framework of a European vision, what economically and culturally characterizes our continent must be defined in order to work out specific alternatives and solutions. Five parameters seem essential: accessibility, health, security, and the investment of money and time (see figure).

This willingness to formulate the goals and needs of the population (whether these needs have been expressed or not) must not remain merely theoretical. Associating the population with the very first stages in the development of innovative projects, offering the population more opportunities to participate in the pre-decision processes, cannot help but enable people to understand the issues more clearly and to accept changes, as well as improve the proposals themselves.

Some cases deserve to be studied in this respect. For example, Switzerland regularly calls on the population to make judgements through referendums. The latter can notably involve the financing or the construction of road and railway infrastructures: this occurred in February 2016 in regard to the construction of the second Gothard tunnel, and in February 2017 in regard to the FORTA funds for national roadways and traffic in urban agglomerations.

Similarly, the Assises nationales de la Mobilité initiative organized in Paris, in autumn 2017, by the Ministry for the Ecological and Inclusive Transition, has opened up a new perspective by proposing a participatory approach open to all citizens[31]. Public meetings were organized across France to debate the needs and the constraints related to mobility, while a website gathered, first, pertinent information surfacing from these meetings and, secondly, voluntary contributions. (More than 2,500 proposals and 25,000 votes were recorded on the internet platform that was set up.) Bringing together experts and concerned citizens, this in-depth deliberation was initiated by French President Emmanuel Macron in July 2017; at the same time, he announced an orientation law, scheduled for early 2018, on mobility. Noting that "the transport policies which we have inherited, and which have been based on a single infrastructure policy, have not allowed us to respond to the expectations of our fellow citizens with respect to mobility", the French Minister for Transport insisted on the necessity of remediating the sentiment, shared by many citizens, that mobility is a factor of exclusion[32]. Whereas "75% of all movements involving transport cover less than 5 kilometres", the Assises initiative has in addition identified an aspiration to cultural change involving soft kinds of mobility,

Needs in social terms	**Accessibility**	• Easy access to a means of transport • Persons with reduced mobility
	Health	• Lowering pollution levels • Quality of Life
	Affordable solutions	• Ratio salary/ transport cost
	Time optimisation	• Rapidity and punctuality of the transport mode • Comfort: WiFi on trains, electrical outlets...
	Security	• Reliable infrastructures (railway crossings, bike paths, etc.)

31 Ministère de la Transition écologique et solidaire [Ministry for the Ecological and Inclusive Transition], « Présentation; Les Assises de la mobilité: contribuer pour réinventer la mobilité »
https://www.assisesdelamobilite.gouv.fr/comprendre/presentation

32 Concluding speech at the Assises nationales de la mobilité, by Elisabeth Borne, Minister for Transport, attached to the Ministre d'État, Minister for the Ecological and Inclusive Transition], 13.12.2017
https://www.ecologique-solidaire.gouv.fr/node/2115

with bike transport notably being one of the most frequently topics brought up during public meetings. A more extensive participatory event for citizens, the "Parlons Vélo" [Let's Talk about Bikes] consultation organized by the Fédération française des usagers de la bicyclette (FUB), generated more than 110,000 responses[33].

Public hearings, consultation meetings, and public information sessions also belong to the kinds of political action and accompanying measures that can facilitate the transition towards innovative transport policies. These forward-looking methods keep us from forgetting that the infrastructures and means of transport must, first and foremost, position themselves as the services best designed to respond to the needs of economic actors and, more generally, the whole population. Whereas new technologies and the rapid digitalization of transport systems create new ways of organizing movement from one place to another, they also lead to an upheaval of the social structure, and this consequence is not without inducing reactions. Some initiatives resulting from technology give rise to an optimization of transports but are not without consequences for the relationships between the professionals involved, implying collaboration between structures that must adapt and sometimes modify themselves. For example, these issues are raised in Switzerland, where the CFF (Chemins de fer fédéraux) national railroad company is massively investing in digital technologies with the aim of eventually managing all train travel, from the first to the last kilometre. This kind of initiative works toward a better visibility of the network and increased efficiency, but it also implies many changes and adaptations within the company, as many for current partners as for those who will arrive specifically because of the on-going evolution.

The question of the social acceptability of decisions involving transport is far from being restricted to territorial policy issues (the construction of roads, airports, or other infrastructures). New forms of transport can arise only when they benefit, if not from a consensus, then at least from the consent of the population. The same question is raised, for example, in the framework of a proactive policy in favour of the rapid development of electric vehicles. This new market will not establish itself as reliable and sustainable unless it meets the express condition of obtaining the confidence of motorists. When backing new projects that affect the customs and practices of the population, it is not only wise, but also necessary, to set up as soon as possible *ad hoc* accompanying strategies. For the same reason, an adequate legislative framework is needed to facilitate the development of new forms of mobility involving sharing or car-pooling.

IN ECONOMIC TERMS

Two facts are obvious from the onset: first, greenhouse gas emissions resulting from freight transport are increasing more than those associated with the movement of people from one place to another; secondly, the policies aimed at delocalizing production sites within Europe, plus the supplying of goods from outside Europe, and new kinds of purchasing behaviour have generated this substantial growth of transport flows. Moreover, the low cost of transport is one of the several criteria that can make businesses decide to set up their production sites far from their markets, in Eastern Europe for instance, or outside Europe. But what will happen when policies aimed at fighting global warming likely result in more expensive transport costs?

Given the urgency of climate change, these facts suffice to show the obsolescence, at least in part, of our current economic model, all the more so in that it depends on the extremely fragmented value chains that have resulted from the low cost of transports. This manifesto is, of course, not intended to be a tract against the development of international trade; instead, it advocates in-depth thinking about how to better conceive trade in our day and age of industry 4.0, 3D printing, and decentralized energy generation: it is undeniably necessary to remodel trade exchanges to make them compatible with a policy of reducing CO_2 and to rethink production capabilities to avoid the increase in basically useless movements from one place to another. Inventing models that will enable the economy of the future to be structured indeed implies going back to the initial purpose of road transport: above all, the private sector seeks available, easy, and direct means of transport so that goods and products can be dispatched from point A to point B. The optimization of distribution chains in an effort to make them compatible with sustainability will not take

33 Fédération française des usagers de la bicyclette, "la contribution majeure des assises de la mobilité s'appelle 'parlons vélo'", https://www.fub.fr/fub/actualites/contribution-majeure-assises-mobilite-s-appelle-parlons-velo

place without in-depth thinking about production chains. Transport is, in fact, at the heart of the European strategies of companies desiring to manage it in an efficient, economical way, and to control it from beginning to end, which explains why such companies are investing massively in new infrastructures[34].

In all events, the involvement and constructive cooperation of the private sector are indispensable for setting up CO_2 reduction policies in practical ways: not only because companies depend heavily on transport, but also because of the sizeable investments involved. Governments alone are far from being able to meet the investment costs to develop electric mobility, sustainable bio or synthetic fuels, and connected infrastructures. Yet several transport companies have already begun to make decisive efforts in this regard. The Air France "Lab'line for the Future" project can be cited. It was set up in 2014 for Toulouse-Paris flights and uses biofuels. Similarly, to remain in the aeronautic field, the Belgian group Solvay, specialized in composite materials, entered the Solar Impulse project in 2014 and enabled the Swiss pilot Bertrand Piccard to make, in July 2016, the first round-the-world airplane flight uniquely powered by solar energy. These companies are not philanthropic: convinced that the innovations of today shape the competiveness of tomorrow, they are banking on research and sustainable development; and their perspective indeed remains that of generating long-term benefits and employment.

Private initiatives of this kind are not lacking. What is more obviously missing is the capacity to coordinate such initiatives and, more broadly, the cooperation between private and public sectors needed to build a sustainable mobility policy that keeps efforts from being scattered.

The time has therefore come to work together on the reindustrialization of Europe in a concerted, harmonious, and efficient way. The sectors calling for massive investment are many in number. The field of digital systems should especially be focused on. Many experts already consider this field to be the key factor of a fourth industrial revolution that will ultimately rationalize all the supply channels. In a world of multilateral governance, States are induced *de facto* to share the processes of decision-making and financing with other actors (cities, multinational corporations, NGO's); the issues of the technological development of connected systems and of standards that will be applied widely have become central for an entity like Europe. The possibility of optimizing these systems to improve the various modes of transport quickly and fluidly, and even more so, the possibility of shifting from one digital system to another without increasing compatibility problems, represent major issues for saving time and thus money. These questions call for European regulations.

All in all, reinforced cooperation between private and public sectors on the European level would enable two decisive goals for the future of the continent to be reached:

1. The setting up of **regulation policies** and the reinforcement of **accompanying measures** in all their forms.

2. **Private investment in new, not yet competitive, industries in Europe,** similar to the cooperation recently set up between Tesla and the Australian government to produce batteries locally, yet on a large scale.

What is therefore at stake is a practical commitment to following up on these proposals in the short and medium-term. The purpose of this manifesto is to outline how member States of the EU, the EEE, and EFTA can set into motion incisive policies and together become the driving force encouraging initiatives and their development. These opportunities are indeed outlined on the European level: it is up to the member States to seize them.

IN ENVIRONMENTAL TERMS

By setting as the primary goal the necessity of keeping global warming below 2°C with respect to preindustrial levels and by constraining the signatory States to disinvest in fossil energies to attain "carbon neutrality", the Paris Agreement does not exclusively focus on C02 emissions. The Agreement is committed to reducing greenhouse gas emissions in general: methane, nitrous oxide, as well as halogenated hydrocarbons. In this new economy,

34 Franck Sylvan, *Transport in Europe: investment, competitiveness and ecological transition,* Question d'Europe, Policy Paper de la Fondation Robert Schuman, janvier 2016. https://www.robert-schuman.eu/en/european-issues/0378-transport-in-europe-investment-competitiveness-and-ecological-transition

moreover, the environmental issue includes not only the climate, but also the pollution of the whole atmospheric, terrestrial, and maritime biosphere. For transport, the problem thus entails all emissions: exhaust, abrasion caused by tyres, roads, brakes, etc.

Although one can rightly note that Europe has pioneered in having recourse to new economic tools designed to decarbonize the economy, as well as in implementing the ETS (the European Union Emissions Trading System, which sets a market price for a part of the CO_2 emissions), much remains to be done. Such tools cannot alone solve the problems, but there is no reason to leave transport outside of their scope. Carbon pricing must be used more widely. This is the goal of the Carbon Pricing Leadership Coalition (CPLC)[35] initiated by the World Bank and launched during the COP 21. Twenty-five countries, some 130 companies of various nationalities (Véolia, Royal DSM, Michelin, etc.), and more than thirty important partners from civil society, universities, and NGO's are working together to support and encourage the setting up of carbon pricing for the whole world.

Several companies have already foreseen this process. They have set up, for internal use, a carbon price that they henceforth include when calculating return rates on investments. Such is the case of Michelin[36], which has experimented since 2016 with an in-house carbon price for its own investment projects on the basis of the ratio 50€/tonne of CO_2, a price much higher than the European market assigns to emission permits, considered to be too low to be effective. These carbon valuation instruments[37] should, moreover, gradually include all GHS emissions, not just carbon dioxide.

Finally, although the transport sector must be remodelled quickly, the precautionary principle must be preserved. Advocated by some actors with the goal of reducing oil consumption, the use of (fossil or bio) methane is not without raising qualms. Its combustion is, indeed, less emissive (-15%) and less polluting than petroleum hydrocarbons, but its GHG emission effects are 22 times more virulent than those of C02. The long-term environmental consequences and the leaks along the supply channels are extremely difficult to predict.

35 Carbon Pricing Leadership Coalition (CPLC)
https://www.carbonpricingleadership.org

36 Press release, « Michelin, un acteur engage au service du climat et de la COP23 »
https://www.michelin.com/fre/presse/evenements/cop23

37 Which we prefer to call "valuation" instead of "tax" in the sense that the former term opens up access to several economic instruments enabling us to define by its value the production of greenhouse gas instead of merely taxing it.

A possible framework of action

As regards mobility, European priorities should thus be redefined by taking into account issues of sustainability, social cohesion, and economic transformation. This is the only way of getting beyond the tensions inherent to Europe. After decades devoted to promoting fast mobility over long distances, efforts must be rebalanced and mobility reconsidered by favouring the quality of the everyday life of citizens: to increase the attractiveness of a territorial anchorage without neglecting the principle of free movement, the driving force of the European project.

The speed of relatively long trips is no longer the only main priority of citizens, nor of companies. Populations henceforth aspire more to a transport policy facilitating access to their work and to services, eliminating urban pollution, and reopening the areas of freedom that have gradually been diminished by modern life. Whereas a fast pace of life calling for frequent movement was long viewed as a sign of social and cultural vitality, today this is less true. Recent studies show that such a pace is now associated, by many people, with a feeling that daily life has deteriorated and perceived as a factor increasing the number of family or marriage break-ups. Faced with extreme fatigue, even with the risk of burn-out, a growing part of the population wishes to acquire the means of a harmonious existence, focused more on where one lives[38]. On the urban level, it is no longer as much a matter of improving the traffic flow as that of creating a liveable space no longer requiring incessant movements from one place to another. Allowing the population to recover a better personal equilibrium, with a more local anchorage, induces a greater spatial and temporal flexibility in the organization of work (free hours, increasing the opening hours of various urban venues, telework, etc.).

On the "rural" level, it is essential to remain connected to the modern world, to employment areas, and to enjoy more equity in regard to services. Europe must also accompany these aspirations.

METHODOLOGICAL QUESTIONS: THE SYSTEMIC QUALITY OF EUROPEAN TRANSPORT

Remodelling transport demands not only taking into account all sectors involved in it, but also stimulating these various sectors to work in synergy with all the European actors involved with mobility issues in one way or another. Although the schema that we are proposing has been built up from European specificities and calls for a *de facto* implementation by the EU, it should also be noted that it could be transposed to other continents.

However, the EU and various European organizations must facilitate, synthesize, and orchestrate new approaches. China, Japan, and South Korea are making great strides in transforming mobility and have already endowed themselves with powerful industrial strategies. To have clout tomorrow, and to hold down a position in export, Europe must go forward united and instil a new dynamic. This means going well beyond the recommendations outlined by the European Commission in their White Paper of 2011 and its successive "supplements". We need a common ambition with common goals, a shared road map, a few harmonized regulations, and a few economic tools to help minimize the risks for long-term investment.

For this, our thinking must not be restricted to transport modes, but also encompass greater socio-economic perspectives. It is crucial that political debates leave behind the age-old opposition between road and rail, at a moment in time when we are witnessing the spontaneous, rapid remodelling of practices favouring multimodality, as much among citizens as on the business level, because of new modes of information. According to a recent study[39], ever more numerous transport users take advantage of digital tools to compare easily and precisely the various transport modes available to them, even to shift from one mode to another, while no longer systematically favouring personal vehicles as the only "natural" means of moving from one place to another.

38 On this point, see: Vincent Kaufmann and Emmanuel Ravalet, *From weak signals to mobility scenarios: A prospective study of France in 2050.* International Scientific Conference on Mobility and Transport Transforming Urban Mobility, 2016.
See also: Emmanuel Ravalet, Stéphanie Vincent-Geslin and Vincent Kaufmann, *Tranches de vie mobile,* Paris: Loco éditions, 2014.

39 *Ibid.*

All these facts have stimulated non-State organizations to take up the initiative of proposing practical action plans to both the private and the public sectors. For instance, the Paris Process on Mobility and Climate (PPMC), a multipartite partnership created during the preparations for the COP 21, has given itself the goal of accompanying the gradual decarbonization of the transport sector by facilitating the dialogue with all the actors involved. The publication that has stemmed from this, "An Actionable Vision of Transport Decarbonization: Implementing the Paris Agreement in a Global Macro-Roadmap aiming at net-zero emission Transport"[40], deals with all the transport modes and outlines a global, social and, especially, realistic vision that can be set up on the horizon defined by the Paris Agreement. In eight chapters, the proposal details action for any country wishing to go as far as possible in reducing carbon levels of transport: the transformation of urban mobility; the strategy for making low-carbon energies available; the improvement of modal efficiency; the optimization of supply chains—for both production and distribution—in the market sector; the reduction of the number of useless movements from one place to another; solutions suited for rural areas; the adaptation of transport systems to climate changes; and the economic tools for accompanying the transition. This roadmap, whose usefulness has already been emphasized by several countries, is a basis that encourages the sharing of ambitious thinking about Europe.

A EUROPEAN ROADMAP

a. Cities

Often pioneers as we have seen, the big urban areas represent a central issue for European development and for boosting sustainable transport projects. Usually making up the hub of wealth of a region, or even a country, they attract an important part of the population, a decisive share of the economic activities, and thus the transports that these activities engender. Moreover, for more than fifty years now, the amount of commuting from one's home to one's workplace has continued to increase at the same rate as urban sprawl. At the same time, logically, the difference between the number of jobs located in cities and the number of city dwellers has grown, the latter leaving the city for the suburbs because of increased comfort or lower budgets. In France, for example, it is estimated that nearly three out of every four salaried workers leave the commune where they live to go to work; in addition, 77% of the jobs in France are located in urban centres while only 63% of salaried workers live there; whereas suburbs, where 22% of the active workforce lives, only represent 12% of the jobs[41].

This is not to forget that the distances travelled are generally shorter in big urban areas than elsewhere, which makes possible both experimentation and the setting up of new prototypes adapted to public transport. Cities represent an all the more important challenge in that a substantial number of short-term results are at stake: reducing carbon levels, by means of its immediate secondary effect of reducing pollution, can induce many identifiable benefits for the population, notably for the highly sensitive issue of health. For example, London, which launched a Low Emission Zone in 2008, has already announced that its city centre will become an Ultra Low Emission Zone by 2019[42]. The new standards will apply to a precisely defined zone, ranging from the Mayfair district in the west to the City Hall district in the east, from Clerkenwell in the north to Vauxhall in the south. This same zone has already been declared a "Congestion Charge Zone", with the aim of reducing the congestion in the centre of London: private vehicle drivers must pay a charge to enter the zone.

In the same way, by 2025, which is relatively soon, Copenhagen has set the goal of attaining the highest level of traditional fuel reduction by creating a Zero Emission Zone[43]. Three main levers

40 Paris Process on Mobility and Climate (PPMC) "An Actionable Vision of Transport Decarbonization: Implementing the Paris Agreement in a Global Macro-Roadmap aiming at net-zero emission Transport"
English link: http://www.ppmc-transport.org/wp-content/uploads/2016/11/Global-Macro-Roadmap-Consultation-Draft-March-2017.pdf

41 Brigitte Baccaïni, François Sémécurbe, Gwenaëlle Thomas, *Les déplacements domicile-travail amplifiés par la périurbanisation,* Pôle Analyse territoriale, Insee, March 2007.
Available via this link: https://www.insee.fr/fr/statistiques/1280781

42 An ULEZ is a zone in which cars, motorcycles, vans, buses, coaches and lorries will all need to meet exhaust emission standards or pay a daily charge to travel.

43 Copenhagen: CPH Climate Plan 2025
See http://www.c40.org/profiles/2013-copenhagen

have been set up to reach this goal: increasing the cycling possibilities even more (the modal part of which currently attains the 30%-40% level thanks to a more than 300-kilometre bike-lane network), improving the public transport network by expanding the metro network with a Cityringen (a metro city ring linking the quarters of Østerbro [east], Nørrebro [north], and Vesterbro [west] with the city center), and favouring clean vehicles. Besides other measures, this includes making available electric vehicles managed by the city public transport system.

Actually, less publicized initiatives are increasingly cropping up in European cities. By March 2015, 211 Low Emission Zones already existed in ten European countries. Although these LEZ's are conceived in various ways from one country to the next, all rely on the same European standards. Most of the time, lorries and coaches are prevented from entering a LEZ. However, the cases of two very advanced countries should be highlighted since they represent 85% of the LEZ's inventoried in Europe: in Germany, light-duty vehicles (those belonging to both individuals and companies) are excluded, while in Italy, even motorcycles are excluded. Moreover, the sizes of Low Emission Zones are extremely variable: the zone might cover only a small part of a city centre, as in Illsfeld, Germany, where a 2-km2 LEZ can be found, or, on the other hand, group several municipalities into a single zone, such as the Ruhr LEZ, also in Germany, which covers a 800 km^2 area.

Europe must become the driving force, and the coordinator, of these kinds of short or medium-term projects, and especially encourage them, including when they are set up in smaller cities. This implies both creating the necessary market conditions that will enable the proposed transport modes to evolve and facilitating the big investments demanded by the three gradual stages in carbon reduction: moving from a Low Emission Zone to an Ultra Low Emission Zone, and then to a Zero Emission Zone. At the same time, Europe must actively work towards forging a social consensus within the population by singling out the model cities and by widely publicizing the practical benefits obtained for their inhabitants.

Why not create a dynamic European approach with the goal that, by 2030 at the latest, all towns of more than 50,000 inhabitants have a ULEZ town centre and that all towns without exception, by 2040, have no more toxic exhaust pollution? What social and economic momentum we could draw from the innovations forstered for soft mobility, shared (public or private) transport, zero-emission vehicles, and last-mile logistics!

The approach is both realistic and exhilarating, including the perspective that it opens up for cities that are good places to live in and, if necessary, settle in.

b. Energy

As the indispensable condition for the sustainable development of transports, as well as for restoring the energy independence of Europe, the development of European low-carbon energies possesses a substantial potential for improvement and must imperatively be backed. This was underscored by the European Commission, in 2016, in its strategy for low-emission mobility, an orientation calling for "speeding up the deployment of low-emission alternative energy for transport, such as advanced biofuels, electricity, hydrogen and renewable synthetic fuels and removing obstacles to the electrification of transport"[44].

Replacing (most) vehicles powered by traditional fuels with electric vehicles makes sense only if the electricity used comes from a sustainable low-carbon production source. The same applies to hydrogen, which, by means of fuel cells, will fill out the energy supply for electromobility.

Taking into account all solutions and all transport modes, the change toward low-carbon mobility calls for three priority initiatives:

1. **Decarbonizing electricity production** by using renewable solar, hydraulic, and wind energies.

2. Developing the production and use of **clean hydrogen,** for example by means of electrolysis.

3. Investing in the **development of biofuels or synthetic fuels,** especially for the road sector.

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44 Press release, "Commission publishes Strategy for low-emission mobility ", European Commission, July 2016 https://ec.europa.eu/transport/themes/strategies/news/2016-07-20-decarbonisation_fr

The crucial issue here consists of the accompanying procedures that can be set up by European organizations to back all these measures. It is not a matter of uncompromisingly eliminating fossil energy before giving ourselves the means to replace it, but rather of orchestrating a gradual evolution by encouraging an energy mix that will ultimately reduce drastically the use of fossil energies.

The other essential point consists of standing up to monolithic and dogmatic visions that attempt to substantiate the idea that it would be unnecessary, or economically unrealistic, to bank on these three lines of action simultaneously. Let's be clear about this: no successful transformation is possible if we do not collectively have these three assets at our disposal.

c. Modal efficiency and intermodality

Modal efficiency

Although insufficient in themselves, specific measures for each transport mode obviously remain necessary. For example, the gradual replacement of passenger cars, which emit on the average some 200 gr of CO_2 per kilometre (for sedan cars under real conditions), must continue. With the technologies at our disposal, lowering this level to 50 gr of CO_2 per km (well-to-wheel) for new cars will conceivably be feasible before 2035. Lorries are obviously included in this same problem of substantially reducing emissions. The solutions likely to be massively employed for road freight are still little known. This is why major efforts in research and development, and in bringing together the key people involved in energy and road transport, must be undertaken without delay. The same is true of the maritime sector for which liquefied natural gas (LNG) appears to be an interesting transition solution, even if no long-term solution enjoys a consensus today.

However, one battle that should be begun and won without delay is that of electrifying two-wheeled vehicles for city use. Generally speaking, Europe has fallen behind schedule on this topic, which is all the more incomprehensible in that the investments required for creating the necessary infrastructures are minimal.

As to trains, which emit little GHG when they are electrified and even less so when powered with low-carbon electricity, they should continue to be electrified; regional travel with diesel-motor powered trains (and sometimes by means of substitute buses) does not represent a sustainable solution for the future. Hydrogen appears to be an interesting solution in this case, as for some bus and car fleets, for aviation (hybrid technologies enabling liquid-fuel take-offs then electricity-powered cruising), as well as for river and maritime coastal transport.

In all cases, energy change must be accompanied by major efforts in regard to the energy efficiency of the various transport modes, all of which are vastly improvable. For road, rail, and soft mobility alike, the practical measures to improve modal efficiency today are as follows:

1. Introduce **carbon pricing.**

2. Encourage **the creation of Low Emission Zones** with the aim of transforming them into Zero Emission Zones.

3. Develop the **electrification of the railroad system.**

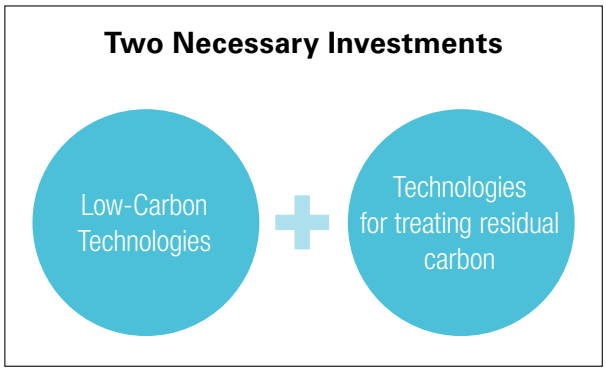
4. Develop **infrastructures devoted to soft mobility** (especially bike lanes).

5. **Rationalize movements** by means of connected applications.

It is obviously illusory to think that the transport sector can totally eliminate CO_2 emissions; none of the current solutions that can be set up on a large scale are "Zero CO_2eq Emissions". Making preparations for solutions that aim to compensate for the residual emissions is thus essential. Among the hypotheses under discussion, capturing and/or storing CO_2[45] should be studied in depth: cost, real capacities, long-term environmental consequences. Norway has acquired some recent experience in land-based CO_2 storage: in October 2017, the Norwegian company Statoil announced that it had signed a partnership agreement with Shell and Total to develop a CO_2 storage project on the Norwegian continental plateau. Although several initiatives backed by the European Commission have recently been set up, notably in the United

45 International Energy Agency, Carbon Capture and Storage: The solution for deep emissions reductions, 2015 http://www.iea.org/publications/freepublications/publication/CarbonCaptureandStorageThesolutionfordeepemissionsreductions.pdf

Kingdom but also in France and Spain, the United States and China nonetheless remain at the forefront of this field[46].



Intermodality

Intermodality means the possibility for travellers or for freight transport professionals to move easily from one transport mode to another and therefore combine the various respective advantages to reduce the economic costs and the environmental impact. On the whole, European infrastructures are suitable to the development of intermodality, even if intermodal capacity obviously depends on the geographical and political situation of each country. For example, intermodality is used more often in Switzerland, where train transport represents about 46% of all commercial transport, than in the Czech Republic, where commercial transport represents only 25% of all commercial transport.

The transport of goods must also be distinguished from the transport of people. It is commonly admitted that road transport initially ensures an invaluable flexibility that rail transport is unable to offer. However, the modal parts of the transport of people are more and more complementary, since users seek innovative solutions, especially to reduce stress and nuisances[47]. Facilitated by digital applications, these solutions range, for instance, from making bikes and electric vehicles (perhaps autonomous in the future) available near train stations to sophisticated, efficacious analyses of schedules to enhance flexibility; that is, to coordinate moves from one means of transport to another, and make train changes easier. While many local, even national initiatives exist, there is a glaring lack of coordination at the European level and even between neighbouring countries.

New technologies have fostered several innovations making transport at once more comfortable and less polluting. It is all the more motivating to contribute to their development in that the public demands them. The emergence of new, not yet imagined, tools must be favoured to broaden the existing options available (whence the importance of start-ups).

d. The logistic transformation: reconfiguring logistic circuits and instruments?

The principle of the free movement of goods has of course participated in the overall growth of the European economy by facilitating and increasing trade, by diversifying the locations of production bases, but its foreseeable consequence has been the fragmentation of, as well as the big increase in the number of, circuits of supply, production, and distribution. As if in a chain reaction, this has induced a dramatic rise in logistics and its impact on the environment.

This pitfall is all the more ominous, in this period when carbon levels must be reduced, because, once again, road transport pollutes more than any other transport mode yet possesses the advantages of an undeniable flexibility and a cost that currently remains more than competitive. As a first step, circuits must thus be optimized by fighting against useless movements from one place to another and, in order to accomplish this, by activating several political levers, some of which must be given top priority:

1. **Authorize cabotage,** the transport of goods or people within a country's borders. European regulations have become somewhat more flexible since 2010: they now allow three cabotage trips during the seven days following the unloading of international merchandize. However, the number of lorries returning empty to the countries from which they originally departed remains too high (a third of the return trips).

2. Encourage **digital tools mutualizing transports** among companies to increase the number of lorries filled up both on the way to and

46 Eric Albert, « Climat: l'Europe veut relancer la séquestration du CO_2 », *Le Monde,* 4 février 2015 http://www.lemonde.fr/energies/article/2015/02/04/climat-l-europe-veut-relancer-la-sequestration-du-co2_4569587_1653054.html

47 Vincent Kaufmann and Emmanuel Ravalet, *From weak signals to mobility scenarios: A prospective study of France in 2050,* International Scientific Conference on Mobility and Transport Transforming Urban Mobility, 2016.

on the way back (examples exist for the supply chain—Centres de Consolidation et Collaboration (CCC)—working with the Carrefour supermarket chain).

3. Generate the **conditions of increased competition** between different transport modes to enhance the attractiveness of rail transport.

In the long term, European organizations should help the private sector, not only to drastically reduce the number of empty lorry runs sometimes occurring over very long distances, but also to strive towards creating a circular economy. The example of the German group DHL can be cited in this respect: the group has committed itself to zero emission logistical solutions by the year 2050[48]. This commitment notably stems from a decision to remodel logistical equipment to favour carbon efficiency, as well as from measures designed to improve the living conditions of salaried workers by offering them low-carbon transport solutions adapted to their daily needs (fleets of bicycles and electric vehicles made available to them).

e. Creating reduced transport areas

On the continental level, the rapid development of infrastructures designed for long-distance transport (airports, high-speed railway lines, motorway networks) liberated individual transport and deeply modified people's mobility habits, which were considerably reinforced in the process. Indeed, preceding generations lived near their workplace and only exceptionally undertook long-distance travel (which was thus all the more prestigious), but the constant increase in the kilometres travelled by Europeans is also due to demographic factors and to cultural evolutions. However, a highly important part of this increase comes from what is called "reversible mobility". The expression refers to professional movements from one place to another which might cover a long distance, but which are short-term, and it also encompasses all kinds of commuting between workplaces and living places. It can be noted that long-distance commuters have become more and more numerous, a fact that suffices to make their situation less enviable: in 2015, commuting represented 8.1% of the workforce within the EU-28[49]. Several countries weigh in heavily on this average: Belgium, followed by the United Kingdom, the Netherlands, Austria, and Slovakia. The standard profile of a long-distance commuter is an educated man, between 25 and 34 years old.

Long encouraged in the name of free movement, which has permitted cross-border commuting (notably in some German regions like the Ruhr, as well as in Poland and Slovakia), reversible mobility has become controversial, not only with respect to the fight against global warming, but also because more and more European citizens view it negatively. The arrival of professionals from elsewhere, when one has difficulties earning one's livelihood, can be perceived as a destabilizing factor for the employment market and even provoke resentment from some local residents. It is important not to overlook this negative viewpoint which, otherwise, is likely to feed already "flourishing" anti-European sentiment[50].

Together with the improvement of urban life and the creation of specific solutions for rural and suburban zones, the answer probably depends on the cultural evolution of how Europeans move from one place to another. Without giving up any aspects of the principle of free movement of people, it is a matter of encouraging and enhancing the value, not of reversible mobility, but rather of settling in the region or country of one's work: it is a matter of putting forward the better living conditions that can result from taking root in a place and the genuine knowledge of otherness that enables (and is enabled by) involvement in local community life. Professional mobility can become a way of discovering, enhancing, and appropriating new areas, instead of remaining a constant race from one means of transport to another. Whereas moving frequently between one country and another has long been viewed positively, the decision to settle for a while in a foreign country and thereby to stimulate intercultural exchange, can be viewed

48 Press release, "Deutsche Post DHL Group s'engage en faveur de services logistiques à zéro émission d'ici 2050", 3 August 2017 http://www.dhl.fr/fr/presse/communiques/communiques_2017/local/deutsche_post_dhl_group_sengage_en_faveur_de_services_logistiques_a_zero_emission_dici_2050.html

49 Eurostat, Statistics explained, "Statistics on commuting patterns at regional level" http://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_on_commuting_patterns_at_regional_level

50 On this topic, see: A. Audikana et V. Kaufmann, *Mobilité et libre circulation en Europe.* Un regard suisse, 216e Cahier rouge de la Fondation Jean Monnet pour l'Europe, éditions Economica, February 2017.

even more positively, in the same way as the Erasmus programme has long done for all the students of EU member countries.

To be specific, this evolution partly depends on cultural perceptions, which decision-makers can help to change. For example, and unless it is admitted that English has been established *de facto* as the new *lingua franca*, developing and improving the learning of European languages would not systematically have to be associated with the prestigious possibility of travelling all around Europe (and thus with planning recurrent long-distance trips), but rather with the possibility of settling abroad for a while, of taking root for a more or less long period in a place chosen for living and acquiring new experiences.

Furthermore, computerization can generate new forms of work that reduce both short and long-distance commuting. Teleworking and the growing number of co-working spaces advantageously use an employee's skills by offering him the ability to organize his time and his movements to avoid rush-hour transports[51]. These solutions correspond to the aspirations of an increasing part of the workforce, who seek to recover a harmonious balance between professional life and family life. Companies and public administrations should therefore be encouraged to revolutionize work-related commuting practices by means of mobility or travel plans.

Finally, the recent connected applications call for special attention. Not only because one can imagine new technologies facilitating the evolution from road to rail transport or improving the flexibility of freight transport, but also because they are likely to favour the emergence of new practices relying on vehicle sharing. Several applications have already shown their worth in terms of cost and convenience, like BlaBlacar, Uber, Moovit, and Lyft—to cite only the best known examples. These new technological modalities greatly participate in the desire expressed by citizens to refrain from using personal vehicles that have become more and more costly in time as well as money (traffic jams, parking prices, etc.).

Being recent, these applications represent only a first step: digitalization has a strong development potential, at least for the transport of people. Efficient, easy-to-use websites also bring substantial improvements in terms of accessibility and the elimination of useless trips. Reserving train tickets online offers a prime example: the passenger no longer needs to go to a sometimes faraway point of sale and the organization of his or her future trips is facilitated. As for freight, the development of new applications or websites should also be accompanied; in the short term, they could rationalize transports and invent new modes of pooling or sharing.

f. Creating specific solutions for rural and suburban zones

Although cities undeniably show their dynamism when remodelling transport possibilities, these possibilities often come to a halt at the city limits and provide few benefits to suburban zones. This situation is partly due to the fact that the number of potential users decreases with distance from the city centre. In addition, public transport focused on the economic and cultural centre of a city often restricts the possibilities of traveling from one suburb to another: the suburban passenger must first travel to the city centre before heading back out to another suburban area. Since attractive, fast, and efficient transport alternatives (inter-suburban metro, bus, and train networks) are lacking, many users have recourse to an individual means of transport out of necessity, and they often remain in their car until they arrive at their destination. What results is the dense congestion of the large economic areas, and the price of this is high in terms of both the environment and nuisance.

A study conducted by the city of Zurich, Switzerland[52], confirms this double-helix movement experienced by most big cities: the population moves to the suburbs, often because of housing costs, but subsequently tends to use individual transport to reach the economic city centre. Similarly, studies conducted in the Île-de-France region[53] show that

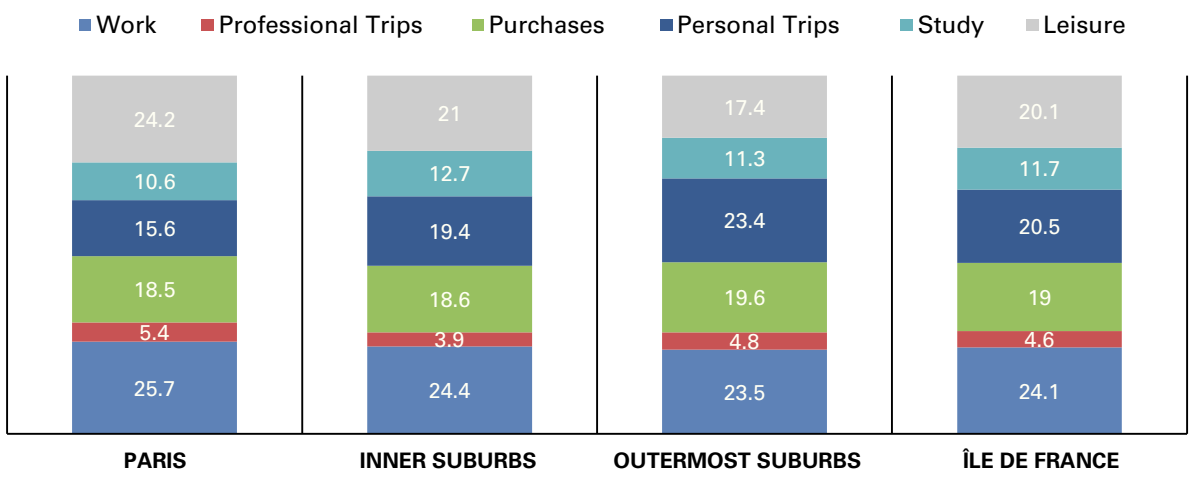
51 On this topic, see: Michel Bierlaire, Vincent Kaufmann and Patrick Rérat (editors), *La mobilité en questions,* Lausanne : Presses polytechniques et universitaires romandes (PPUR), 2017.

52 Pierre Dessemontet, Sandra Walter, André Ourednik, and Vincent Kaufmann, *Étude sur les effets spatiaux du développement de l'offre dans le domaine du transport régional de personne – Analyse du projet de S-Bahn 2G sur le Canton de Zurich.* Lausanne : CEAT, 2013.

53 Commissariat général au développement durable – Service de l'observation et des statistiques, *« Les Franciliens consacrent 1h20 par jour à leurs déplacements »,* December 2010 http://www.statistiques.developpement-durable.gouv.fr/fileadmin/documents/_shared/pdf/IDF_cle0ec212.pdf

Typology of movements made in Paris and its suburbs

Source : INSEE-SOES, ENTD 2008



inhabitants of the inner and outermost suburbs of Paris have an inevitable number of movements from one place to another—be they for professional, medical, or commercial reasons—much more so than Parisians, who can devote a greater number of their movements to leisure. However, work remains, in all events, the prime reason for movements from one place to another[54].

This problem of inadequate public transport in rural and suburban zones is all the more crucial in that the urbanization rate in Europe is high (about 70%, including the suburbs, as we have seen) and in that this inadequacy not only fosters congestion in cities because of the use of personal vehicles to get there, but also impedes both their decongestion and urban sprawl: city dwellers hesitate to settle in less populated outlying zones, specifically fearing that they will be faced with inadequate transport and traffic jams. Urban sprawl, which would give some relief to capitals and big cities, cannot develop unless it is accompanied by a policy of creating adequate transport. This can be set up quickly, if we manage to

1. **Increase the number of self-service electric vehicles** by expanding the service as much as possible.
2. **Promote proactively all kinds of sharing** (car-pooling, car sharing).
3. **Expand public transport networks** by partly decentralizing them.

In regard to this latter point, one cannot help but point to the Crossrail Project for Greater London, which should open in 2018 and eventually consist of 118 kilometres of urban rails[55], as well as to the Grand Paris Express metro system[56]. The biggest urban transport construction project in Europe to this day, the Grand Paris Express project will consist of 200 kilometres of railroad and 68 new stations that will gradually open between 2019 and 2030. Serving the large centres of activity on the outskirts of Paris (airports, business centres, research centres, universities), it will simultaneously enable passengers to move from one point to another in Île-de-France without going through Paris and to get more quickly to the heart of the capital from the suburbs.

In rural or sparsely inhabited zones, at least two structuring factors should be encouraged: first, the major asset that can result from the decentralized generation of renewable energies (electric or other

54 Commissariat general au développement durable – Service de l'observation et des statistiques, *Op. cit.*

55 « À Londres, le chantier ferroviaire Crossrail trace sa voie », *lemoniteur.fr,* 08 June 2016 https://www.lemoniteur.fr/article/a-londres-le-chantier-ferroviaire-crossrail-trace-sa-voie-32421236

56 See https://www.societedugrandparis.fr/gpe/le-grand-paris-express-en-resume

kinds) to speed up the shift to new vehicles, and, second, the vast benefits that can stem from organized car sharing and car-pooling services.

g. Investing in adaptation

Adapting to climate change

Although the consequences of climate disruption on transport infrastructures and services during the next several decades cannot be precisely predicted, recent events indicate that preparations must be made for them. Major difficulties already threaten several world regions in specific ways, as was insisted upon by the Prime Minister of the Fiji Islands, who was the president of the COP23 in Bonn, Germany, in autumn 2017, after leading the battle within the framework of the Alliance of Small Island States (AOSIS), which consists of 44 countries threatened in the short term[57].

Although the situation can seem less urgent in Europe, historically the Netherlands have long had to master the battle against rising water. For several years now, the country has adapted and expanded its dike system to reduce vulnerability to rising water levels by creating new polders or modifying the course of streams. The case of Réunion can also be mentioned. In 2015, the island undertook the construction of a 12.5-kilometre road on piles capable of resisting 150 km/h winds[58]. This type of construction should be considered for other risk areas.

However, the different kinds of risks that can affect the various transport modes must be distinguished. A priori, roads and railroads are the most vulnerable and likely to be damaged by all natural catastrophes. Moreover, they are vulnerable to rising temperatures: in periods of scorching heat, train breakdowns have often occurred because of deformed catenaries. Finally, cities must not be neglected in the prevention of risks specifically due to global warming: high urban density always threatens to act like a heat trap and increase even more the potential impact of high temperatures on materials that have not been conceived to resist them.

Adapting infrastructures

On the societal level, a seemingly secondary factor turns out to be a sensitive issue for public authorities: the coexistence of new and old technologies. The most obvious example stems from the necessity, in a more or less near future, of having on the same roads traditional gas or electric cars and autonomous vehicles not needing a driver. For the time being, Europe is subjected to a convention on road traffic, agreed upon in Vienna in 1968 and still in force in most European countries: it stipulates that "every moving vehicle or combination of vehicles shall have a driver".

In fact, the emerging transition period will necessitate adapting infrastructures to guarantee security for all. The same is also true of insurance and taxation. States must adapt to new forms of taxation that have been created (notably *mobility pricing*, which consists of taxing users according to the number of kilometres they actually travel). Today focused on carbon taxes, mobility taxation will ultimately have to evolve since the fleet of electric vehicles is bound to increase massively.

h. Using economic tools

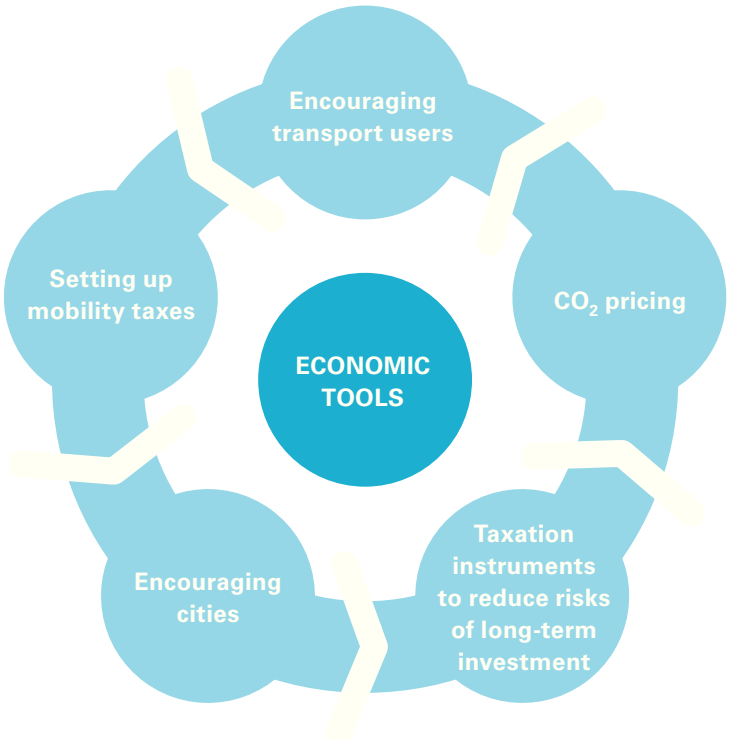
An overall transport transformation strategy will have a price and necessitate massive investments from the private sector. The role of governments, the EU, and the various intergovernmental organizations consists of activating the many existing or future economic levers to encourage the private sector to make commitments. Investments in low-carbon technologies must be facilitated by ensuring quicker returns on investments and reduced risks for long-term investments in such technologies. It is a matter of encouraging a movement that is already, in part, spontaneously underway: the private sector has already increased the number of positive signs,

57 Pierre Cochez, "Les îles Fidji, si vulnérables au changement climatique", *La Croix,* 06 November 2017
Available on this link: https://www.la-croix.com/Sciences-et-ethique/Environnement/iles-Fidji-vulnerables-changement-climatique-2017-11-06-1200889760

58 Caroline Piquet "Plus de 16 milliards d'euros pour la route la plus chère de France", *Le Figaro,* 11 April 2014
http://www.lefigaro.fr/conjoncture/2014/04/11/20002-20140411ARTFIG00027-plus-de-16-milliard-d-euros-pour-la-route-la-plus-chere-de-france.php

accepting and even advocating carbon pricing. Already in 2015, the Business and Climate Summit[59], organized in Paris, defended the hypothesis of an ambitious climate agreement. This unprecedented mobilization of 25 worldwide networks, representing more than 6 million businesses in more than 130 countries, concluded with an appeal to policymakers "to leverage public funds and private sector finance towards low-carbon assets; to introduce carefully designed, robust and predictable carbon pricing; and to eliminate fossil fuel subsidies".

Businesses have understood that they can be winners only if the transition towards a low-carbon economy is worked out through long-term, solid, and predictable public policies. By backing investments and risk reduction, Europe can benefit from the momentum of the private sector. In this respect, Europe possesses an economically dynamic perspective that its decision-makers, facing the urgency of climate change, have insufficiently taken into account.



59 Press release of the Business and Climate Summit, May 2015
http://www.businessclimatesummit.com/wp-content/uploads/2015/05/Business-Climate-Summit-Press-release.pdf

Becoming the driving force behind change

Some of the transformations called for by this manifesto can be set up promptly. These include policies for reducing useless movements from one place to another, for promoting soft mobility in cities, and for encouraging the rural world to favour sustainability. At the same time, it is essential to develop a communication policy that is both all-encompassing (focused on the notion of the common good) and detailed. The population must be associated in practical ways with the process of transformation necessitated by the fight against global warming, to make the process viable and to allow everyone to plan a less anxiety-ridden future.

Most transport policies come under the authority of national governments, yet no solution can be lastingly developed if it remains within the confines of a State. Europe has a historic role to play on the climate issue for several reasons, all of which are likely to restore the sparkle that long made the continent a symbol of the future. Europe must establish itself as the driving force by harmoniously setting into motion the new sustainable transport solutions, by instituting environmental standards, as well as by working out accompanying policies that are not restricted to financing infrastructures. Europe must also stimulate in-depth thinking about future development strategies for the major European transport routes. Regaining control is necessary both for restoring a common (surely symbolic in part, yet not insignificant) dynamic and for reinforcing the European internal market, which cannot take place without sharing a proactive policy.

Destined to be the driving force behind this transformation, Europe must give rise to a mobilization momentum that sweeps all the States along with it and makes it attractive in the eyes of citizens. It is important to insist here on the mode of governance of the transport sector, a sector upon which the various States sometimes give the impression of imposing necessary changes through onerous policies potentially viewed as burdens by the private sector, more than by encouraging the latter to seek innovation. To cite a single example: whereas the cost issue comes up immediately whenever the important economic actors in the European transport market are interviewed, it has been proven that road transport currently remains the most competitive kind of transport in terms of cost and flexibility. The fact is that road transport also pollutes more. But contenting oneself with increasing the cost with the hope of reducing the use runs the strong risk of having disastrous consequences for very small businesses and small and medium sized enterprises (SME's), to the extent of modifying the economic structure of some regions, even some countries. Inversely, the innovative solutions put forward in this manifesto will be all the more efficient if they are backed by the actors themselves through a dynamic of change orchestrated on the European level.

This dynamic of change depends on three essential pillars:

1. **A genuine willingness to associate the population** with changes so that it understands the necessity and the stakes of them.

2. **An ability to convince decision-makers** by developing a logical and realistic vision.

3. **A respect for the collective nature of this dynamic,** which must be careful about not producing outcasts from society, on the regional or State level.

Europe offers an especially fertile ground for this: awareness and social mobilization are already effective in terms of climate change. For example, countless private initiatives have speeded up, in just a few years, the dynamic of sharing in Europe (BlaBlaCar, Mobility, the new services of bikes on demand, etc.). This willingness must not be hampered. On the contrary, it should be accompanied with a desire for improvement and development. This is why these initiatives call for action at the European level, even if they are far from uniquely engaging that level.

However, it is possible that some examples promoted in this manifesto cannot be applied with the same facility everywhere in Europe. The particularities of each State do not make uniformly applicable the new cultural or commercial proposals: the company Uber, for instance, has come up against French legislation about regulating the supply of chauffeured cars. Europe nonetheless possesses the power to offer overall, appropriate, realistic accompanying measures to favour

existing synergies between various private initiatives, public or private partnerships, and investment aids.

All in all, the EU and the other intergovernmental organizations must be made fully aware of their regulatory and initiatory role, so as to harmonize the various kinds of legislation and guide national decisions toward common strategic goals. At the same time, the EU and the complex political system on which it depends obviously sometimes make the decision-making processes difficult to grasp. European institutions must also ponder issues of participation and, in the strongest sense of the term, of institutional accountability. The transport field, notably through the setting up of European networks, has always shown itself to be an innovative laboratory for relationships between government, institutions, and civil society. The setting up of innovative policies in terms of sustainable transport would gain in transparency and efficiency if they were supported by procedural innovations.

Conclusion

The time of bewilderment is behind us. The question is no longer one of grasping the urgency of the climate change that is imposed upon the entire planet and stuns public opinion, but rather one of imagining and constructing together the responses that will enable us to get going again towards a future rich in new perspectives and in unheard-of improvements in terms of mobility.

Inevitable in the short term, the transformations that must take place in the transport sector represent a historic opportunity to deal out the cards once again, which can and should of course lead to a new situation on the environmental level, but also on economic, social, and even cultural levels. It cannot merely take place on the level of States or European institutions, but the latter must organize the transformation in a way that opens the playing field as widely as possible for actors of the civil society and associations, whose commitment is essential. The time when national or supranational institutions scheduled the evolution of transport by means of infrastructures is over; a multitude of current initiatives and indispensable investments is now under the responsibility of the private sector. Yet European decision-makers have great responsibilities because of their ability to stimulate, accompany, structure, and harmonize the increasing number of dynamic actions that are emerging and calling for the evolution of national and European regulations, the modes of investment and taxation—one of the thorniest issues on the European level. The primary issue among these is probably liberating the ability to innovate, for actors of the transport sector, but also for citizens in their daily practices in an age of digital revolution. As has been seen in these pages, mobility problems nourish the sentiment, felt by a certain number of European citizens, of having lost their footing on the very foundation of Europe, and their faith in its project. Transforming transports can offer a unique opportunity of reaching out a hand to them.

In the transport field, the business world has also increasingly grasped how vital it is to invest in the on-going transformation. Recent news bears witness to this favourable dynamic. On 12 December 2017, during the international One Planet Summit brought together by President Emmanuel Macron to take stock of the progress of the Paris Agreement two years after its signing, European nations, cites, and businesses shared their strong commitments and showed their willingness to be on the front lines of the transformation in progress. Of the twelve commitments resulting from the summit, the seventh is titled "Zero-pollution transports"[60]. Eight countries, of which six are European—Finland, France, Holland, Norway, Portugal, and Sweden—have committed themselves, in the framework of the Transport Decarbonization Alliance, to aim for net zero emission mobility in 2050.

On this same occasion, Germany, Belgium, Cyprus, Denmark, Spain, Finland, France, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Poland, Portugal, The Czech Republic, Romania, Slovenia, Sweden, and the United Kingdom signed the "Tony de Brum" Declaration calling for ambitious progress in limiting CO_2 emissions under the auspices of the International Maritime Organization.

At the same time, Germany, France, the Netherlands, the United Kingdom and Sweden committed themselves to examining the possibility of setting up a significant carbon pricing system, according to the recommendations of the Stern-Stiglitz Commission, while the Breakthrough Energy Coalition announced a pilot partnership programme between its investor group and five member States of the innovation mission, including France and the United Kingdom, as well as the European Commission, to speed up the availability of new low-carbon technologies.

One could continue to cite examples, like a litany of good intentions. But the stakes of this Manifesto is, first and foremost, to transform the initiatives into a vast movement, coordinated at the level of our continent, which has the means and the tools to give it an incomparable scale. The mobility revolution offers the possibility of giving a new momentum to the European project. In all senses of the expression, this means supplying fresh air to European citizens. All the young people in our countries aspire to this. We cannot allow ourselves to disappoint them. All together, let's meet the challenge!

60 One Planet Summit, "Les 12 engagements One Planet" https://www.oneplanetsummit.fr/en/the-12-oneplanet-commitments/

The authors

Pat Cox has been president of the Jean Monnet Foundation for Europe since January 2015. He was elected as a Member of the European Parliament in 1989 and served there until 2004, a period during which he was also President of the European Parliament (2002-2004). Since that time, he has worked regularly with European institutions, notably, since 2015, on the European corridor project, where he is the Coordinator for the Scandinavian-Mediterranean Corridor.

Patrick Oliva is a chemical engineer with a doctorate in physical sciences. In 1982, he joined the Michelin group and worked there until 2017. He was, notably, Corporate Vice President in charge of Prospective and Sustainable Development, and subsequently External Relations Director in the domains of sustainable mobility and energy transition. Among his numerous international activities in the field of mobility, he is a cofounder with SLoCaT of the partnership PPMC – Paris Process on Mobility and Climate.

Vincent Kaufmann is an Associated Professor at the École Polytechnique Fédérale of Lausanne and director of the Laboratory of Urban Sociology. Specialized in the field of urban lifestyles, territorial management policies, and urban transport, he works on the notion and the importance of mobility from a sociological perspective. He has also been a researcher at the University of Lancaster and at the École Nationale des Ponts et Chaussées in Paris.

Niklaus Lundsgaard-Hansen began working in the Bern cantonal administration after studying law at the University of Bern. He later became the personal advisor for the former Federal Councillor Adolf Ogi in the Federal Department of Transport, Communications and Energy. After a few years spent in the private sector, he began working for the Touring Club Suisse in 2008. Since 2013, he has been Head of the Office of Road Traffic and Navigation for the canton of Bern.

Leo Huberts is an advisor for Pat Cox on trans-European Scandinavian-Mediterranean Corridor projects. He works as an administrator of the Directorate-General for Mobility and Transport (DG MOVE) for the European Commission, in the Single European Sky department.

Ander Audikana is currently a researcher at the University of Deutso in Spain. He has been a scientific collaborator at the École Polytechnique Fédérale of Lausanne and a Fulbright-Schuman researcher at the University of California in Berkeley and at George Mason University. His research deals with urban and territorial policies in Europe.

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The Foundation was created in 1978 by Jean Monnet, the designer of the first European Community and the first honorary citizen of Europe. He entrusted all his archives to the Foundation. An independent institution serving the public interest, a non-partisan and a non-militant structure, the Foundation receives support from the State of Vaud, the Swiss Confederation and the City of Lausanne. It operates out of the Dorigny Farm, located in the heart of the campus of the University of Lausanne, its main partner.

Today the Foundation houses and exhibits many other private archives, notably those of Robert Marjolin and the European papers of Robert Schuman and Jacques Delors, as well as iconographic and audio-visual documents. It includes a specialized library and a European documentation centre. The Foundation collects testimony from key actors and witnesses as a part of its filmed interview programme. It thus provides users, and especially researchers, with a coherent corpus of documentary resources on the origins and development of European construction and on Switzerland-Europe relations. Each year, the Foundation awards its Henri Rieben Scholarship to several advanced PhD students.

Thanks to the internationally recognised importance of these collections and to the collaboration between Jean Monnet and Professor Henri Rieben, who chaired the Foundation until 2005, the Foundation has become a European intellectual crossroads and an essential venue for meetings, debates, and reflection about major current European issues. It regularly organises conferences, European dialogues, and international symposia, forming partnerships with prestigious institutions. It periodically awards its Gold Medal to prominent political figures who have worked for the common interest of Europeans; among the laureates are José Manuel Barroso, Emilio Colombo, Mario Draghi, Valéry Giscard d'Estaing, Jean-Claude Juncker, Helmut Kohl, Romano Prodi, Helmut Schmidt, Martin Schulz, Javier Solana, and Herman Van Rompuy. The Foundation also welcomes many visitors and researchers, who are given assistance in their work, in addition to contributing to the training of students. Thanks to support from the State of Vaud, the Foundation created a new activity in 2016, a "think tank" made up of a group of experts, currently working on sustainable mobility in Europe.

An editorial mission supplements the range of the Foundation's activities. The Red Books Collection, which was created by Henri Rieben in 1957, has been co-published with Economica since 2007 and now comprises 218 titles. A new series of shorter publications, the Debates and Documents Collection, was launched in 2014. These publications tend to highlight the Foundation's documentary collections, its public events, or the expertise of its members and partners.

Every year, the General Assembly of the Council of the Foundation - consisting of about 500 members from all walks of life - is held, as well as the Scientific Committee. Pat Cox, former president of the European Parliament and the European Movement International, has been the president of the Foundation since 1st January 2015. His predecessors are José Maria Gil-Robles (2009-2014), a former president of the European Parliament and the European Movement International; Bronisław Geremek (2006-2008), Member of the European Parliament and former Minister of Foreign Affairs of Poland; and Henri Rieben (1978-2005), professor at the University of Lausanne. The institution has been managed since 2012 by Gilles Grin, Doctor in international relations and lecturer at the University of Lausanne.

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Fondation Jean Monnet pour l'Europe
Ferme de Dorigny
CH - 1015 Lausanne
www.jean-monnet.ch

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